IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication AUGUST 24, 1961

★ Portable Electric Tool Shows—

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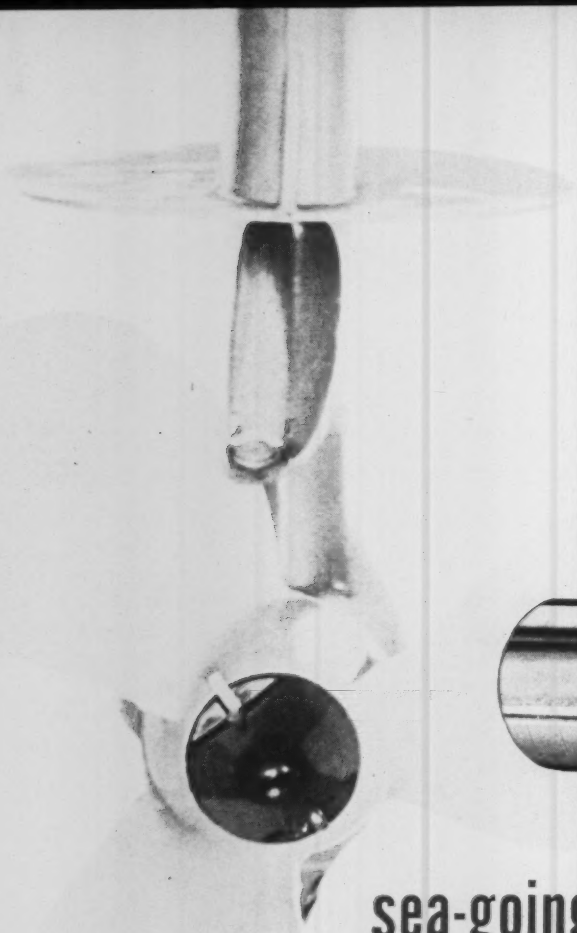

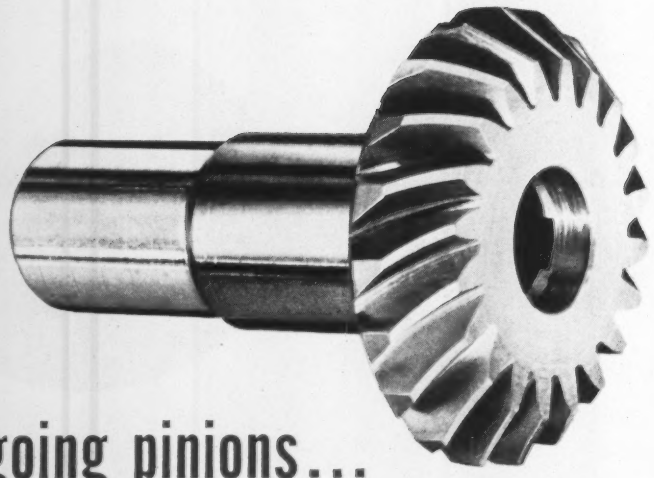

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KNOW YOUR ALLOY STEELS . . .

This is one of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many who may find it useful to review fundamentals from time to time.

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Tests for Determining Mechanical Properties of Alloy Steels

The types of tests used to evaluate the mechanical properties of an alloy steel depend upon the end use of the steel involved. Mechanical properties are determined usually by tension, bend, and hardness tests, and by a group of special tests employed on tubular and wire products.

(1) *Tension tests* provide means of determining tensile strength, yield point, yield strength, proof stress, proportional limit, per cent elongation, and per cent reduction of area. This sort of test subjects the steel to stresses resulting from the application of an axial tensile load to the specimen ends, the load being sufficient to rupture the specimen.

(2) *Bend tests* often aid in determining the ductility of steel. The severity of such a test depends largely upon the bending radius used. Several factors influence the length of radius, including thickness of the test specimen, width of test specimen, direction of test, chemical composition, tensile strength of specimen, etc.

(3) *Hardness tests* determine the steel's resistance to penetration. This characteristic is most commonly measured by the Brinell Test or the Rockwell Test. In the former, pressure is applied to the surface of a test specimen by means of a ball 10 mm in diameter. Two diameters of the resulting impression are measured and averaged; the average is converted to the hardness number by means of a conversion table. In the Rockwell Test, the degree of hardness is read on a gage; hardness is measured by the penetration of a diamond point or a 1/16-in. steel ball. Rockwell "C" scale readings are used in connection with the diamond point; "B" scale in connection with the steel ball. The "C" and "B" are the most commonly used of the several Rockwell scales.

(4) *Special additional tests* are often made on tubular and wire products. These include such items as hydrostatic and manipulating tests, and torsion and wrapping tests, the latter two being used only with wire.

The subject of testing and its relationships to the end uses of alloy steels has been given broad study by Bethlehem metallurgists. If you desire, they will be glad to discuss any phase of it with you, and also give unbiased opinions on such matters as analysis, proper selection of steels, machinability, etc. Call for their services at any time.

And when you need alloy steels, remember that Bethlehem furnishes the entire range of AISI standard analyses, as well as special-analysis steels and all carbon grades.

This series of alloy steel advertisements is now available as a compact booklet, "Quick Facts about Alloy Steels." If you would like a free copy, please address your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa.

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IRON AGE

August 24, 1961—Vol. 188, No. 8

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Special This Week

Speed Products From Idea to Market

In getting a new product off the drawing board and onto the market, elapsed time becomes a vital factor in success. Portable Electric Tools, Inc., averages one new product a month. Executive committees speed the transition from idea to market. p. 43

ON THE COVER: (left to right): W. B. Davis, vice president-planning; J. L. Baker, president; and R. E. Bigelow, executive vice president, check details of new product.

Auto Deadline Only Week Away

Auto contract talks with the Big Three automakers have entered the last week before the Aug. 31 expiration date. So far, it appears that little progress has been made. Automakers must come up with offer soon, or face prospect of a strike. p. 35

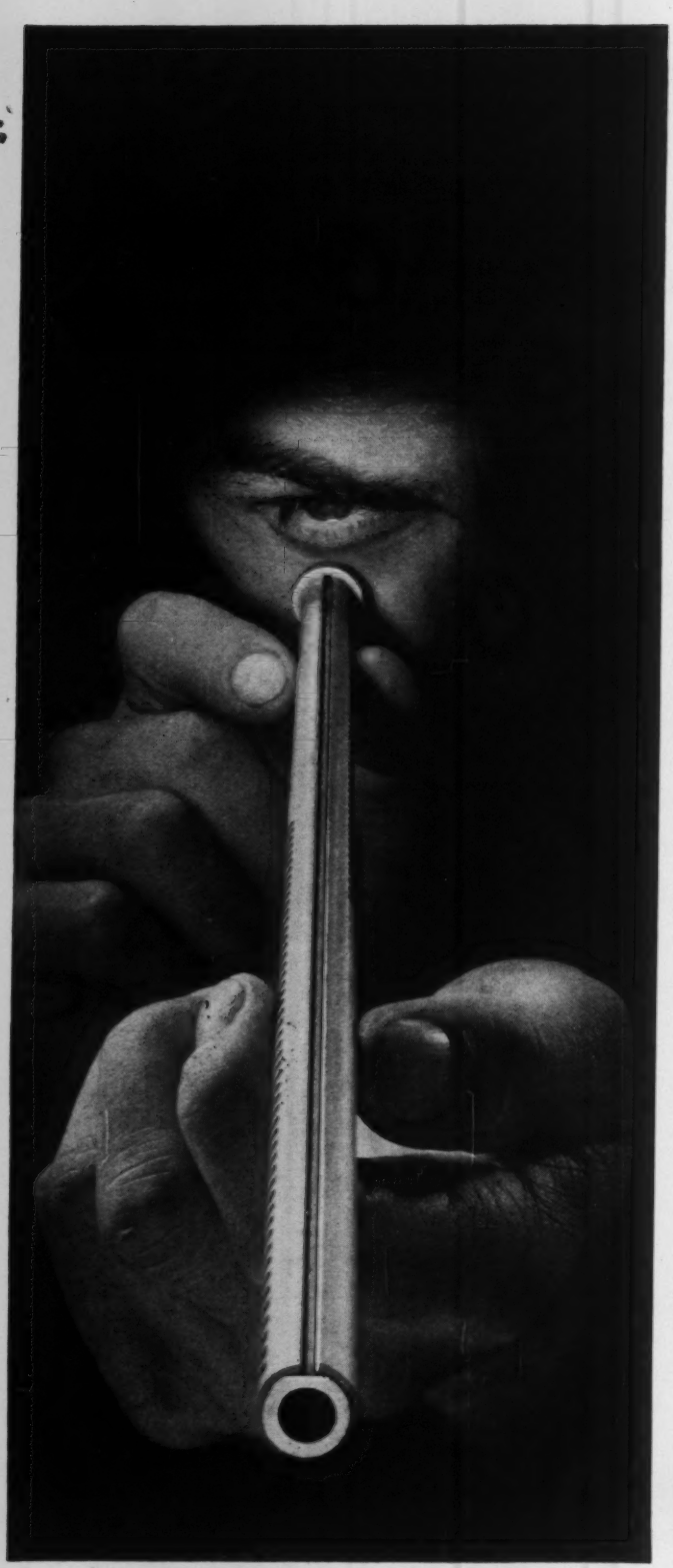
Stainless Gets Cryogenic Stretch

Fabricators are taking advantage of ultracold temperatures. A new forming process uses liquid nitrogen to simultaneously form and strengthen stainless steel. This low-cost process even simplifies the shaping of thin-walled pressure vessels. p. 61

Next Week

Numerical Controls: A Rosy Future?

Why haven't numerical controls been more widely accepted? Can the overall market areas be expanded? Next week's special report explores future prospects. Exports look promising. Many domestic plants are also taking a fresh approach to automation.



how one simple change jumped production 105%

Look at the long slot that runs the length of this typewriter adapter shaft. It was giving Standard Register Co. a costly production headache. Tubing used could only be milled at 7½″ per minute. Finish was poor. Warping and twisting ran rejects to 25%.

Then Ryerson studied the situation and suggested a change in material—to Ledloy® 170 tubing. Using the same tooling, Standard now mills 15½″ per minute—more than double former production. And rejects dropped to zero—the slot is smooth and straight as a die. See for yourself.

How about you? Shouldn't you invite this kind of close look at the material in your products, equipment and plant? A Ryerson specialist may well help you boost production and cut costs in some ways you never thought of. Metalogics is like that.

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The Naked Truth: It's Time We Knew It!

Here at home, words like freedom and individual rights sound nice. We think we know what they mean. We use them every day. We talk about fighting for our freedom and for our heritage.

We will fight—and die—if we have to. We know deep down what it means to be free from domination by a dictator and the state. And it is certain that when we are called on to make sacrifices we will make them without whimpering.

But there are people in the world who really know what freedom means. They are willing to leave all material things behind to go where there is spiritual and physical freedom.

We have some people left in America who feel that we can really do business with the Reds. It is time they knew once and for all that it is difficult, if not impossible, to do so.

Freedom is something which transcends the scholarly treatises on "negotiations" or modern-day-appeasement-by-the-intellect. Thousands flee Red China every day to reach Hong Kong. Why? Because they have tasted Communism in the raw. They know!

Thousands a day fled East Germany, leaving everything behind. Why? Because they brushed against Communism in the mailed fist of the state. Thousands have left—and would leave Cuba today if they could. Why? Because they finally know the difference between freedom and modern-day serfdom—without a scrap of dignity.

There is nothing to negotiate when Mr. Khrushchev violates, again, the four-power agreement on Berlin. There is nothing to negotiate when the Reds use diabolical, psychological moves in tune with Communistic inching acquisitions. There is nothing much to negotiate when the final and complete purpose of the Reds is to bury us.

What then do we do? We stand strong. We arm to the teeth. We use psychological warfare. We use economics. We use trade weapons. We do everything we can to embarrass, upset, and hold back the plans of the Reds to dominate the world. There is no other way out of this no matter what the cost. And until we know that naked truth, we know nothing at all about Red China and Soviet Russia — and their designs on us.

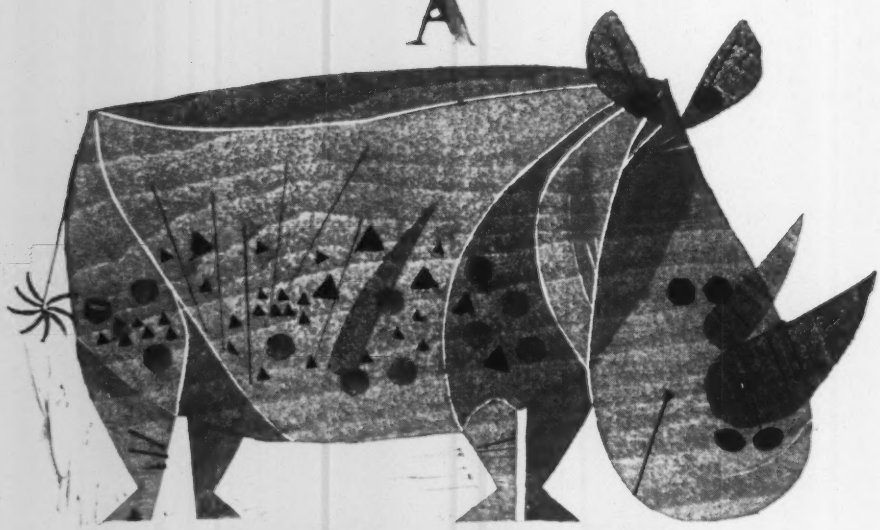
Until we all know what we face, it is nonsense to talk about fighting or dying for freedom because we don't know what we are talking about. It is time we did know.

As the man said, there is no such thing as a free lunch. Sooner or later we pay.

Tom Campbell

Editor-in-Chief

WHAT HIDE IS TO A



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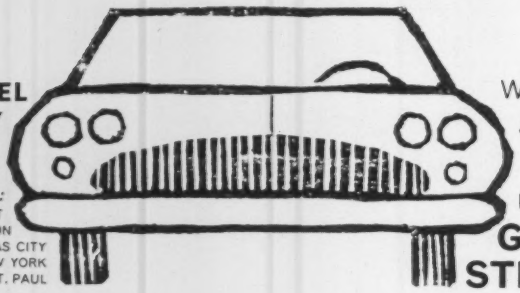

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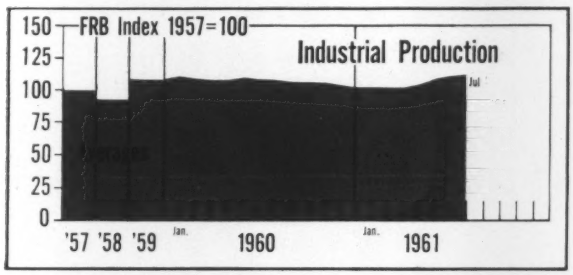
Production Index Hits New High

Industrial production in July rose to an all-time high of 112 as measured by the Federal Reserve Board. This



index reading is 2 pct higher than the June figure. And it breaks the record 111 of January, 1960.

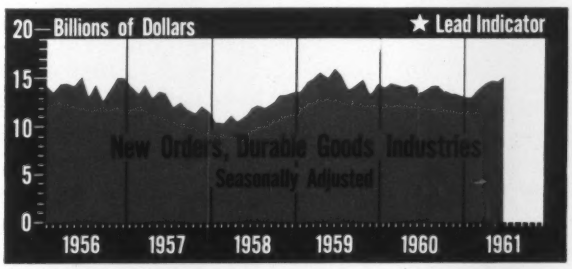
Durable goods makers may well be puzzled by the high July index. Business may not look that good to them. Actually, it isn't—in their case.

For example, in June (latest breakdown data), the durable goods index was 105. This compares to a 110 overall index. Durables production ranged 3 to 22 pct under the overall index. But nondurables production was 7 pct over the overall index. And utilities were a whopping 20 pct over.

While durables are making the biggest production gains, it must be remembered they are recovering from the deepest depths. Production is still under capacity.

Durable Goods Orders Rise

Both new orders and shipments of durable goods in July scored gains over the previous month. New orders for July, at $15.2 billion, were up 2.5 pct over June.



And they were 8 pct higher than July of last year.

Durable goods shipments of $14.8 billion were 1 pct over June, and the same percentage over year-ago level. All data is seasonally adjusted.

July marked the sixth consecutive month of increases in new orders. Durables orders now have advanced 18 pct from the recession low of $12.9 billion in January.

Best direction marker for future durable goods business: July was the sixth straight month that new orders exceeded shipments.

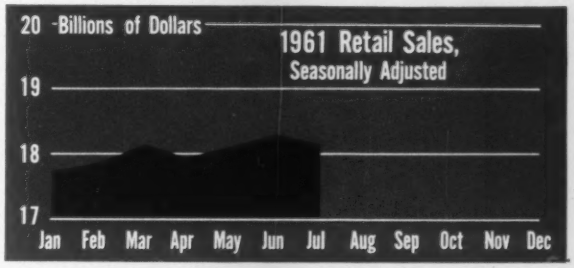
No Boom Due In Fourth Quarter

Most in business look for a high level of sales in the fourth quarter. But they see little actual change from the third to the fourth quarter in either sales or profits. In short, they expect business to remain healthy, but foresee no boom.

This consensus view is drawn from a survey of some 1500 businessmen by Dun & Bradstreet, Inc.

Retail Sales Slip in July

Retail sales dropped to $18.1 billion in July from $18.3 billion in June. But the drop doesn't reflect any significant movement in consumer demand. Because of



unusually high auto sales in early summer, the drop in sales due to model changeover was a sharp one. The drop went beyond seasonal influences.

The story in the July retail sales drop is that lower auto sales more than offset gains in most other lines.

Growing Job: Cost Management

To most in management the handwriting on the wall is clear. It spells out "better business but continued cost pressure."

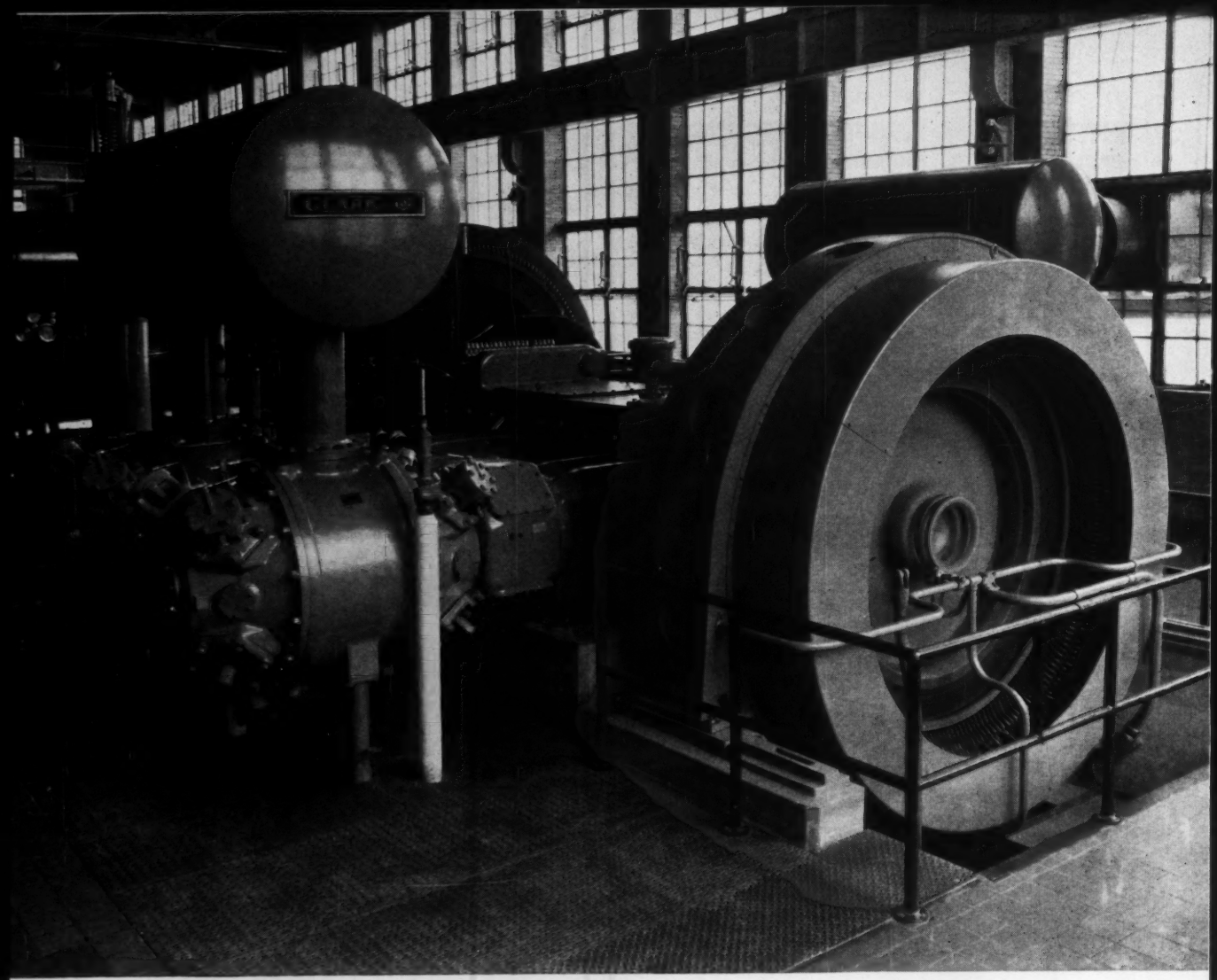
Some cost-management moves already being stepped-up:

Make-or-buy: Porter-Cable Co. is considering making their own motors for their portable tool line. The company has purchased its motors for years.

Product profitability: Philco Corp. is now dropping lines that yield "unsatisfactory profit margins."

Cuts of white collar workers: These worker ranks have swelled greatly. Unions block blue collar cuts. Chrysler, earlier this year, showed the way here.

Moves from "tough labor" areas: It is no secret that Mack Trucks' move from northern New Jersey is due largely to a low labor productivity problem.



Clark Air Compressor Keeps Lid On Maintenance!

Just Plain Dependable—That's the only way to describe this 2000 bhp Clark CBA-4 Balanced/Opposed Compressor. Ten years ago it was installed in the assembly plant of a major Detroit automotive manufacturer. To date, there has been no forced downtime other than scheduled maintenance overhauls.

On Duty 16 Hours a Day, five days a week, the compressor operates as a base load machine supplying 10,000 cfm of air at 105 psi. This is rated at 8% of total plant air utilized to operate the assembly line, paint shops, glass plant, blast furnaces and other functions.

Under a Preventive Maintenance Program, the compressor is overhauled once every two years. After 10 years of service, the valves are still original equipment. Bearings are also original equipment and have required no maintenance since startup.

Besides this Trouble-Free Performance, the user is on the "plus" side in many other respects. Among them: Smooth operation achieved by Clark Balanced/Opposed design; compactness that saves floorspace; simplified, reduced foundation requirements; inherent accessibility; marked simplicity of design.

Covering a Range of 75-8000 BHP, the Clark Balanced/Opposed, Motor-Driven line is increasingly becoming industry's preference for plant air requirements. Complete details are obtainable in Bulletin 185. Write now for your copy or get the facts first hand from your nearest Clark representative.

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Teamsters: Grip Lost On Cincinnati Locals

It appears that more and more Teamster union rank-and-filers are becoming disenchanted with the union and its leader, James Riddle Hoffa. And they are doing something about it.

The giant union lost more than one-third of its Cincinnati - area membership last week. Four complete locals, with 4000 of the estimated 11,000 Teamsters in Cincinnati, voted themselves out of the union. Less than a month ago, several thousand cab drivers in Chicago voted to dump the Teamsters and start their own union.

HOFFA: They went thataway.

The latest revolt was led by James T. Luken, president of the Teamsters Cincinnati Joint Council. He is a long-time critic of Mr. Hoffa. As such, he made the nominating speech for the lone candidate to oppose the union leader at the recent convention.

Teamsters were thwarted recently in a move to organize the nation's top 200 race drivers. NASCAR, sanctioning body for leading automotive race tracks, simply said that members of the new group would be ineligible to race at NASCAR tracks. In the recent breakaways, the membership expressed disappointment over failure of the now-disbanded court monitors to effectively clean up the union.

Productivity Gains Lower than Usual

Productivity gains in 1960 were lower than the post-war average increase, according to the latest study by the Bureau of Labor Statistics.

Output per man-hour worked rose 2.5 pct for all sectors of the private economy last year. The average has been running more than 3 pct per year.

Manufacturing productivity was up by about 2 pct, considerably less than the post-war average of 2.9 pct.

Overall output per man-hour worked has risen 45.6 pct since the 1947-49 base period. Manufacturing gains were 43.4 pct, 32.6 pct in non-manufacturing, and 92.3 pct in agriculture.

BLS says the smaller-than-usual productivity gains were due to the start of the recession toward the end of 1960. It notes "in general, productivity gains tend to be less than average during periods of economic decline, but higher in recovery periods such as 1959, when the increase was more than 4 pct."

Tools: A Minimum Wage?

Labor Secretary Arthur Goldberg soon will determine the prevailing minimum wage in the machine tools industry. His decision will be based on hearings in Washington next month.

The hearings, to be held Sept. 6, will get views from industry, labor and government sources on what wage should be paid machine tool workers under the Walsh-Healey Public Contracts Act.

Under the act, the Secretary of Labor decides what minimum wage must be paid to employes working on government supply contracts over $10,000. There is no determination for the machine tools industry.

The Dept. of Labor reports that the median wage rate in the industry is $2.52 an hour. This median applies to 287 plants covered by the Walsh-Healey Act. These plants get about $35 million in Federal contracts yearly.

Though wages in the industry run anywhere between $1.00 and over $2.75 an hour, the lowest established job rate is near $1.78. Less than 3 pct of the workers make less than $1.70. More than 33 pct make over $2.75.

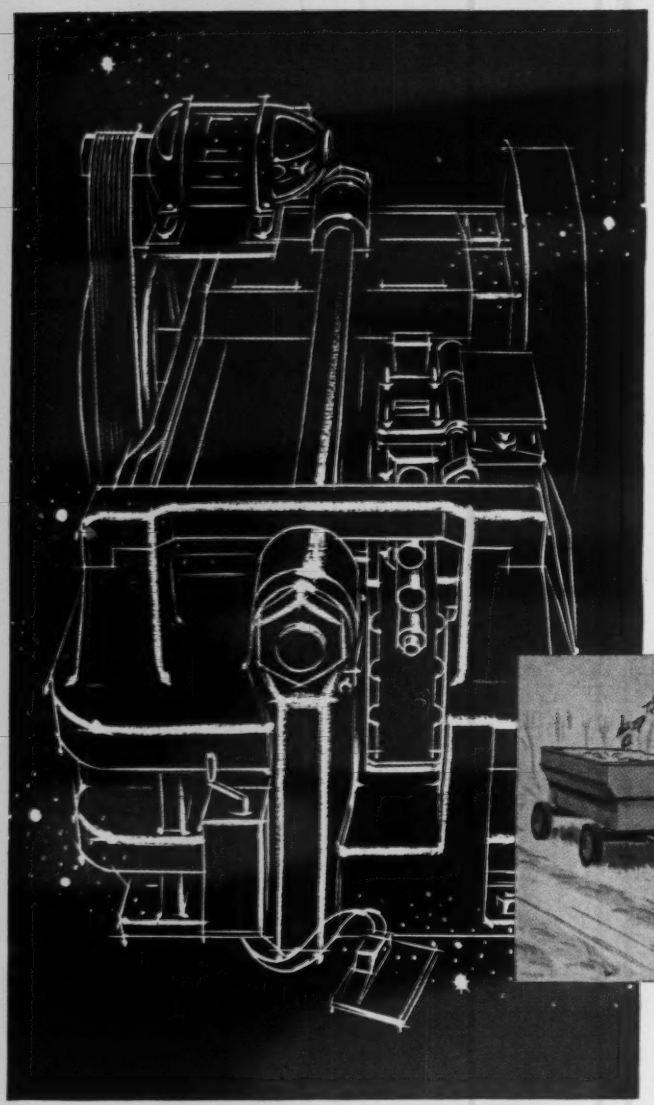
At issue at the hearing will be these questions:

1. Should any amendments be made to the tentative definition of the industry? (Certain tools are excluded from the definition of machine tools.)

2. What are the prevailing minimum wages in the industry?

3. Should an industry-wide determination of wages be made, or should it be limited to smaller geographic areas?

4. Should a lower determination be included for beginners or probationary workers?



RESISTANCE TO PUNISHMENT of any severe-service part increased by designing it to be forged

Upsetter, or horizontal forging machine

Gear blanks for tractor and farm implement transmissions are designed to be upset-forged, usually with integral forged stub shafts. Forging gives these vital parts maximum resistance to gear-clashing shifts. Transmission life can be equal to equipment life when gears are FORGED.

When you *design with forgings* right from the start, you take full advantage of the many benefits which only forgings offer: highest ratio of strength to weight . . . highest resistance to impact, shock, vibration, torsion . . . preferential orientation of flow lines in the forging to concentrate strength where required . . . absence of wasteful inclusions and voids.

Forged parts start out as *better* metal . . . are made *even better* by the hammer blows or pressures of the forging process. Write for literature to help you design, specify, and procure forged parts.

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★ U.S. Mulls Over Controls

In public, government experts on metalworking and defense mobilization laugh off questions of Federal controls of industry. But in private their reaction is quite different.

Though they see no immediate threat of Government controls, particularly price controls on metals industries, they are not so certain about the near future.

One source told The IRON AGE the time to watch closely for a Government move toward controls is late this year or early next year.

They believe controls are not imminent because the country is not "psychologically" ready for them. They also point to the unused capacity in steel, machinery, and other key metals industries. "With such unused capacity," says one source, "it is hard to conceive of a real need for controls at this time."

Notice, however, use of the words "At this time."

These Government experts think controls are possible at a later date because:

1. Increased consumer spending will raise production and the steel operating rate.

2. Increased defense spending will help use up the unused capacity.

3. People will become prepared, psychologically, to accept controls.

There is an inference here that the Kennedy Administration is now preparing the people for such controls. Certainly President Kennedy has given industry fair warning. He has called for several studies of war controls and industry prices.

Defense mobilization sources talk about control plans in case of a national emergency. They talk about selecting base periods for price controls. And they wonder out loud if industry is prepared for government moves toward controls—late this year or early next year.

■ Tax Credit Plan Faces Rough Road

The House Ways and Means Committee's final draft of President Kennedy's tax bill is expected to reach the House floor sometime this week or next. In this draft lies the fate of business investment tax credit.

Congressional delays and opposition to the credit plan will probably keep it from passage this year.

The credit plan, which would allow an 8 pct writeoff by businessmen on their income tax bill for investment in new equipment, has already been labeled "unwise and unwarranted" by the 10 Republican members of the Ways and Means Committee.

House opposition will be strong. But even if the credit plan gets before the House and passes, delays in the Congressional process will hold it up. After House passage, Senate hearings, committee action and full Senate passage would still be necessary.

■ Antitrust Law Study Due Next Month

Sen. Estes Kefauver will preside over hearings next month on legislation seeking stricter antitrust laws. Part of the legislation is aimed directly at a corporate executive's responsibility for antitrust violations by his company.

Individual company men will not be heard at the Senate Antitrust and Monopoly Subcommittee hearings. Business will be represented by various trade associations. Testimony will be heard from Government agencies involved.

The hearings, scheduled for Sept. 6 and 7, will be on five bills. They are:

S. 996—Giving Federal judges the power to restrain antitrust violations from certain corporate jobs upon a showing of probable clause that the persons may engage in more antitrust violations.

S. 2252 and S. 2253—Increasing fines and jail sentences in antitrust cases.

S. 2254—Broadening the responsibility of corporate officials to prevent violations of the antitrust laws by their corporations.

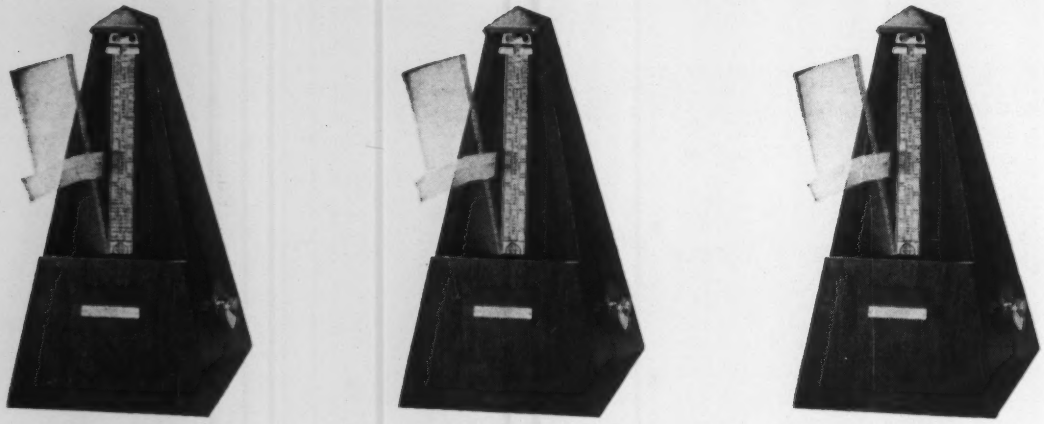
S. 2255—Requiring bidders on government contracts, who have submitted bids identical to a competitor's, to submit certificates that their bids were arrived at without collusion.

■ End to Defense Work Stoppages Wanted

An effort is being made in Congress to end work stoppages on defense jobs. Several Congressmen have come up with independent plans for ending labor-management disputes in times of crisis.

Sen. Francis Case, (R.-S.D.), has introduced legislation to provide the President with authority to "deal with those work stoppages that he considers a threat to our national security."

Meanwhile, Sen. Jacob Javits, (R.-N.Y.), calls for a peace production board to deal with strikes in time of emergency.



POSITIVE DUPLICATION—EVERY TIME!

With these three metronomes—or with a thousand—the time interval you choose can be positively duplicated time after time after time. And with these three Ⓟ Ⓓ surface wheels—as with *all* CINCINNATI Ⓟ Ⓓ GRINDING WHEELS—you'll get the same kind of Positive Duplication *every time*!

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There are 36 unvarying quality control steps in Cincinnati's unique Ⓟ Ⓓ manufacturing process. Right from the start with the choice of the "grains" that go into a wheel, Ⓟ Ⓓ procedures involve exacting checks and re-checks. Every grain characteristic—from size, cleanliness, absence of foreign matter, color, magnetic content, to bulk density before and after blending—must fully satisfy extraordinary Ⓟ Ⓓ specifications, which are followed throughout in all 36 rigid controls.

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CALL CINCINNATI TODAY

Solve your grinding problems with the help of our Cincinnati-trained specialists. Their wide experience in job set-ups and grinding operations is at your service. Just call your CINCINNATI Ⓟ Ⓓ GRINDING WHEEL Distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

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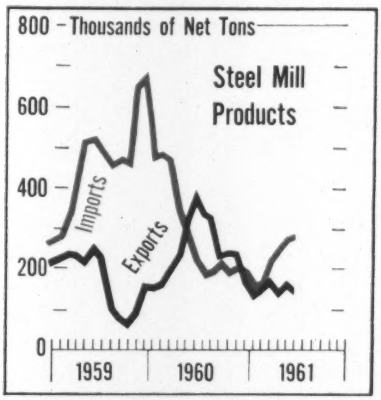
A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Steel Imports Continue Uptrend

Imports of steel continue their uptrend. This is certain to have further effect on the growing debate



over the impact of imports on U. S. metalworking and metalworking jobs. (See "Trade Battle," below, and p. 37.)

For June, imports of steel products totaled 277,000 tons. This is the highest since April, 1960, and compared with exports of 146,000 tons, according to the Dept. of Commerce.

Total imports for the first half reached 1.3 million tons. In spite of the recent increases, this is well below the total for the same period of 1960. However, the 1960 total was increased by foreign steel ordered during the steel strike of 1959—and the shortage period.

Exports for the first six months totaled 890,000 tons, resulting in a substantial deficit in the U. S. steel trade balance. Declines are noted in shipments of sheets, tinplate, rails and heavy structurals.

Rambler Builds More In Canada

American Motors (Canada) Ltd. will start producing 1962 Ramblers Aug. 22 after a three-week changeover, shortest downtime in the Canadian auto industry this year.

The 100-in. wheelbase Rambler American will be built for the first time. This means more than 90 pct of the Ramblers sold in Canada will be Canadian built.

About 100 additional workers will be hired by the end of September as the production rate at the Brampton, Ont., plant is boosted to 48 cars daily. When the plant opened in January, output ran at 32 units a day, increasing to 36 a day near the end of the 1961 model run.

The company is shooting for 18,000 Rambler sales in the 1962 model year compared to 12,000 in 1961.

Trade Battle Shapes Up

The battle-lines already are forming in Washington for next year's fight over the trade policies of the United States.

The battle will pit the Kennedy Administration and free-traders against a growing group of protectionists in Congress. The President plans to hit Congress with a free-trade program next year. It would replace the present reciprocal trade agreements act which expires next June 30. The protectionists are now organizing to fight the President's request.

Latest action—On the Administration side, it is the appointment of Howard C. Peterson, president of Fidelity-Philadelphia Trust Co., to draw up a liberal trade program for the President. It will be Mr. Peterson's job to come up with a program that he can get through Congress.

On the protectionist side, it is a series of hearings which are being held on the impact of imports and exports on American employment. Protectionist leaders are using the hearings to try to prove imports are disastrous to U. S. labor. The steel and aluminum hearings in this series were held last week. (See p. 37.)

Balance of Payments Gains in 2nd Quarter

U. S. imports (for consumption) held at a steady level during June, at $1.189 billion compared with $1.885 billion in May.

The rate of imports for the first half of this year is 11 pct below a year ago. Totals for the first months of this year is $6.8 billion compared with $7.6 billion for the first half of 1960.

At the same time, the Dept. of Commerce reports the balance of international payments showed significant gains during the second quarter of this year.

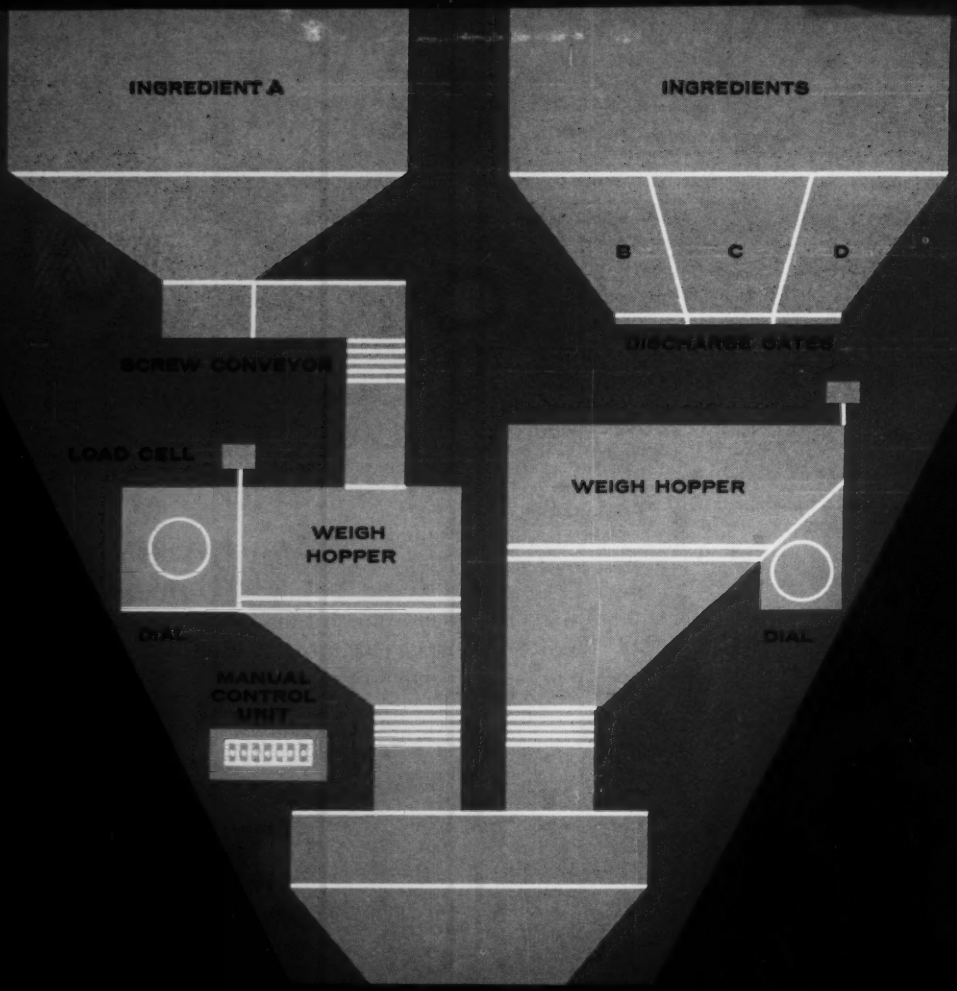
The improvement, however, does not reflect a significant gain of exports over imports. Instead, it reflects large repayments of U. S. government loans by three countries.

In first half imports, finished manufactured products dropped from $426.8 million to $410.3 million. However, the bulk of the decline is in newsprint and burlap.

Tinplate Moves From Wales to West Coast

The Steel Company of Wales will ship 12,500 tons of tinplate coils to San Francisco and other West Coast ports. Shipments are for delivery in October and November to major U. S. canmakers.

Shipments are the first for the company since 1959 when some American sales were made during the steel strike. However, the company now indicates shipments will be on a regular basis.



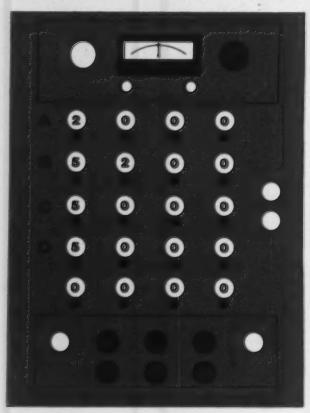
TIME SAVER... MONEY SAVER...

THE NEW FAIRBANKS-MORSE BATCHETRON

One of the latest developments in Fairbanks, Morse's 131 year experience in the weighing business is the *new* Batchetron. It is specifically designed for fast, accurate proportioning of any material that can be pushed, poured or dropped into weigh hoppers. It uses high-speed electronic methods to weigh and batch a number of liquids or solids—in sequence or simultaneously—by means of manual or punched card control.

The Batchetron is easy to set. Its high-speed action assures positive cutoff of ingredient flow. Interlocks prevent incorrect operation . . . halt operation if anything goes wrong. An improved, electronic weight-sensing system provides long, accurate, trouble-free service with exact batch repeatability every time. At all times control of operations is lightning fast.

The control panel of the Batchetron allows the operator to adjust for hopper tare weights, while pilot lights indicate batching startup, sequence and finish.



Use of the F-M Batchetron results in substantial time and money savings for the chemical and food industries . . . for concrete and asphalt batching plants . . . for the many applications where high-speed weighing and proportioning are important. And, of course, the many years of Fairbanks-Morse precision craftsmanship stand behind every Batchetron.

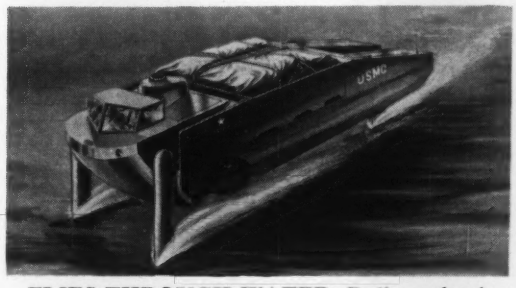
Learn what the Batchetron can do to make *your* operations more profitable.

Write: Fairbanks, Morse & Co.; Electronics Division; 100 Electra Lane, East Station; Yonkers, New York

ELECTRONICS DIVISION
FAIRBANKS MORSE
A MAJOR INDUSTRIAL COMPONENT OF
FAIRBANKS WHITNEY

Cargo Craft Backs Attack

In the future, supplies for U. S. Marine beachheads will be flown in, but not through the air. Instead, hydrofoil landing craft will brave the surf to provide logistic support for an assault. Under development at Avco Corp., a new landing boat teams up gas-turbine power with fully-submerged foils to reach 45-knot speeds in rough seas. Overland speed should exceed 25 mph.



FLIES THROUGH WATER: Rolls on land.

Pushbutton Annealing

Here's a new method of annealing castings that makes a big appeal to common sense. Instead of a separate heat-treat, careful cooling anneals the casting while it's still in the mold. Timing is the key to this program-controlled process. Lower costs are the practical payoff.

Materials March Ahead

New on the materials front is an ultrahigh-strength steel. Heat-treated tensile strength exceeds 360,000 psi; yield strength equals 290,000 psi. Despite its toughness, there's still safe ductility. Elongation in a 2-in. segment ranges between 6-8 pct. In addition, this steel keeps its strength at heats up to 1000°F.

Tracers Check Bearings

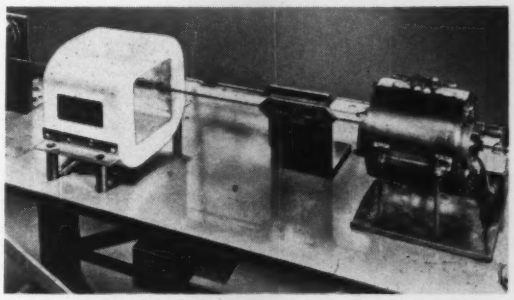
Radioactivity reveals that metal particles transfer from a bearing roller to its race. Tracers also pinpoint how much, and under what conditions, particle transfer occurs. Preliminary radioisotope studies were the tipoff. Metal transfer results from direct surface contact. Wear particles in the lubricant also migrate to the race. With radioactive tracers, bearing makers can pinpoint pressure patterns and determine the best lubricant.

Europe's Quest for Fuel

Gas-recovery systems for LD oxygen vessels are being tried in Europe. Object is to collect carbon-monoxide gas. Monoxide looks good as a fuel for a wide range of uses. One plant even drives a turbine with it. American mills are studying this concept; but they aren't using it yet.

Pinpoints Flaws in Wire

Continuous, high-speed flaw inspection of ferro-magnetic spring wire is now a production-line reality. Heart of the development is a specially-adapted, eddy-current detection method.



SENSING COILS: Spot flaws in wire.

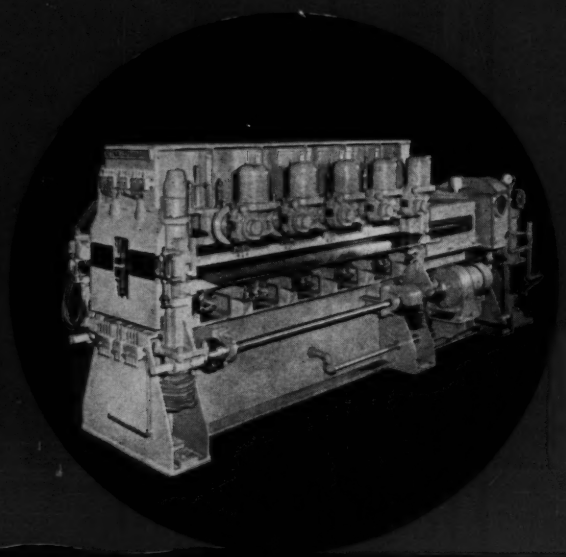
It's the outgrowth of a system originally used for rod and tubing. Circuits signal a tape readout which designates sub-standard sections of the wire under test. These sections are marked by a lacquer spray. The tape itself becomes a permanent record that certifies spring-wire quality.

Ups Power-Plant Output

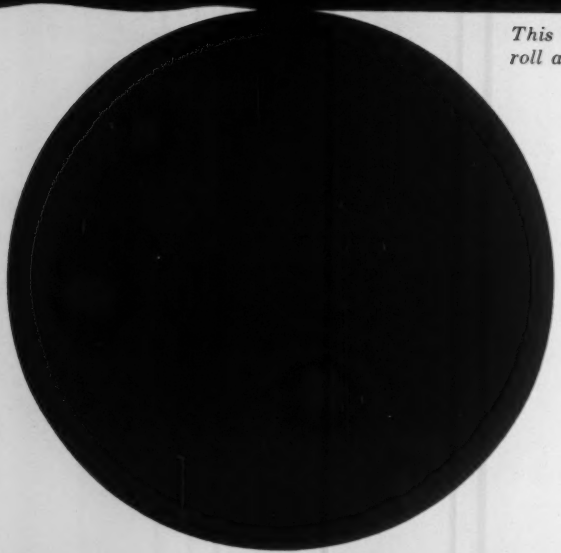
Flame-heated thermionic generators may eventually boost power-plant efficiencies by about 20 pct. Recent development work points the way. A generator that uses conventional fuel is the key item. Very-high heat from burning gas or oil will pass through this device and be converted directly to electricity. The remaining heat, at lower temperatures, can then produce power in a conventional turbine-generator system.

ROLLER LEVELERS

What kind of roller leveler do you need for your particular product? Want high speed? We have high speed levelers. Want an economical model for less demanding work? We have one of the best models in the business. Want a quick opening head? We have either hydraulic or motor-operated or hand-operated models. Want centralized lubrication? We equip all levelers with centralized lubrication with the exception of a few models. Want antifluting? We have it. Want individual adjustment or centralized adjustment? We have both types. Want more roll life per redressing? All of our rolls are induction hardened. Want an existing leveler reconditioned? We have an efficient service setup. What size leveler do you need — 1¼" up to 18" diameter work rolls? We make all sizes and types. In fact, the Aetna-Standard Division of Blaw-Knox is one of the major manufacturers of Roller Levelers. For information, write to Sheet and Strip Sales, Aetna-Standard Division, Blaw-Knox Company, 300 Sixth Avenue, Pittsburgh, Pennsylvania.



This Roller Leveler has individual motor-operated backup roll adjustments. 1¾" dia. x 72" face . . . 21 rolls.



BLAW-KNOX

Aetna-Standard Division

BLAW-KNOX

We Are Ready

Sir—I squared my shoulders and stood up straighter when I read your editorial dated July 20. (Are We Ready? Yes, the People Are!)

You are right in what you say about the people in our country and I agree with you 100 pct. More power to you for telling the truth.

Somehow, some way, Khrushchev should know the truth before we have to prove it to him.—J. V. Honeycutt, vice president, Bethlehem Steel Co.

Welded Bliss

Sir — The article "High-Speed Welder Tames Production Problems" (IA—July 20, '61, p. 100) is an excellent presentation of high frequency resistance welding. I do want to compliment you and your staff on this splendid story.—Barry Buchanan, New York.

Not Generic

Sir—We were most interested in seeing the article " 'H-Iron' Passes the 'Acid Test' " which appeared in your Aug. 3 issue. I think you have done an excellent job.

One point, I believe, should be brought to your attention. That is the necessity of showing the word "H-Iron" in quotation marks. This procedure is necessary since application of the name as a registered name or trademark has been made. We are anxious that it appear as such so as not to give the connotation that it is a generic term.—Russell J. MacMullan, Hydrocarbon Research, Inc., New York.

Money Shortage

Sir—I read with interest your Special Report "Future Shortage of Engineers Starts on Campuses Now" in the June 22 issue.

I believe that your editorial missed the whole point on the engineer shortage. My people don't make as much as floor sweepers until they have three years experience. After four years as an engineer, I am making the same as a "Class A" mechanic. Piece work and overtime would bring his yearly income far above mine.—L. E. Hard, Racine, Wis.

Back in Focus

Sir—I was surprised to note in your Aug. 10 issue that Jones & Lamson has a new president. Since we just elected a new president last Dec. 22, don't you think it's a little premature to name another one?—J. D. Wood, Jones & Lamson Machine Co., Springfield, Vt.

▪ **In "Men in Metalworking," appointments as president and vice president of another company were erroneously shown as officers of Jones & Lamson. Holmes H. Whitmore is very much president of Jones & Lamson. Apologies also to Howard A. Finch and J. A. Gerard, president and vice president, respectively, of Amertool Services, Inc. Mr. Finch was formerly manager of marketing for Jones & Lamson; Mr. Gerard was formerly vice president of Cone Automatic Machining Co.—Ed.**

"Yes, we give money for suggestions such as yours—severance pay."

THE INSIDE STORY

This P&K Microdrawn* tubing solved a serious fuel line corrosion problem in jet engines. The answer: seamless tubing microfinished internally by a special P&K process. No grinding or polishing . . . no cavitation or particle removal problems.

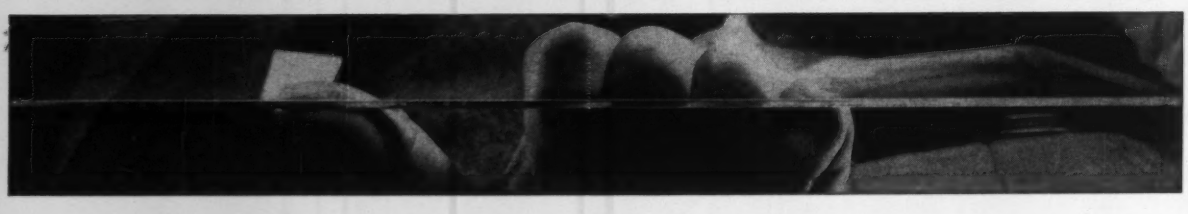
Posen & Kline produces Microdrawn* stainless steel and nickel alloy tubing up to 5/8" OD in every conceivable finish, shape, tolerance, and ID to solve your tubing problems . . . satisfy demanding tubing needs.

Facts in Catalog 10. Posen & Kline Tube Company, Inc., Box 549, Norristown, Pa.

A subsidiary of Handy & Harman.

P&K

Sees $4500 annual screw saving



RB&W fastener survey uncovers use of special item which is replaceable by standard hex screw at much less cost

Of course you pay more for a "special" than a "standard" item—and that includes fasteners. So, when surveying a company's usage of fasteners, the RB&W Man looks sharply for the "specials"—and a valid reason for their use.

He could find no good purpose for the extensive use of screws with heavy head and milled body in one particular product. There was neither a specification requiring close fit in very close tolerance holes . . . nor were there exceptionally "sloppy" holes that called for an oversize head to span.

He therefore recommended assembly with standard RB&W High Strength Hex Screws. They would meet any physical requirement for the "special" being used... *but cost 30¢ less per unit.* Yearly total: $4500 more for *profits* instead of *costs.*

Are you *sure* you're not needlessly wasting dollars on fastener specifications? Let the RB&W fastener expert survey them. He's made proper fastener usage a science, is ready to cooperate with your engineers. Contact Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

R B & W

117th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. Sales agents at: Cleveland, Milwaukee; New Orleans; Denver, Fargo. Distributors from coast to coast.

FATIGUE CRACKS

New Product Payoff

There are few things more important to today's company than a steady flow of new products.

With them a company can keep moving ahead. Without them, it can fall by the wayside. But new product ideas alone are not enough. Product development is a continuing process, carefully directed all along the line.

How It's Done—What's needed to get the job done is explained in this week's special report on p. 43 —"How to Get New Products Off the Ground." The company involved, Portable Electric Tool, Inc., Geneva, Ill., is an excellent example of what new products can do for sales.

Organized by hard-driving J. L. Baker in 1946, its gross sales grew from $257,000 the first year to $14.5 million last year. Mr. Baker, a football player back in the days when the University of Chicago was a member of the Big Ten, applied the same enthusiasm to business.

PRODUCT PLANNERS: New product ideas at Portable Electric Tool, Inc. get attention from top men including Executive Vice President R. B. Bigelow (l.) and President J. L. Baker.

Success Formula—His philosophy for success is built around two ideas: New products are the key to company growth. Earnings should be plowed back to finance expansion.

Ev and Charlie

In the nation's capital last week, News Editor Dick Raddant dropped in on the "Ev and Charlie Show."

As everyone knows, the Ev and Charlie show is a more or less regular joint news conference conducted by Sen. Everett Dirksen, Senate minority leader, and Congressman Charles Halleck, House minority leader. It is filmed and telecast around the country.

It is frankly political and treated irreverently by the press, as indicated in the following account of the pre-conference conversation.

Room for All—As the reporters assembled, one commented on the nine microphones mounted in front of the speakers. "Why so many?", he wondered out loud.

"That's probably for all the nine wings of the Republican Party," another observed. "The one on the extreme right is for the Goldwater faction, the one on the left for Javits." (Jacob Javits, liberal New York Senator.)

A Slight Delay—As the 2 p.m. scheduled time went by, word came that Sen. Dirksen was detained on the floor of the Senate. At that announcement, a national columnist, whose name is a household word, banged down on the table and shouted to the room at large.

"You don't expect me to be kept waiting for this," and started to storm out of the committee room.

"We never have to wait more than 30 seconds for Kennedy," another reporter commented. "But then," he said as an afterthought, "He's not as busy as Ev." (Laughter).

METALLURGICAL LABORATORY SAMPLING

MANCO HYDRAULIC GUILLOTINE

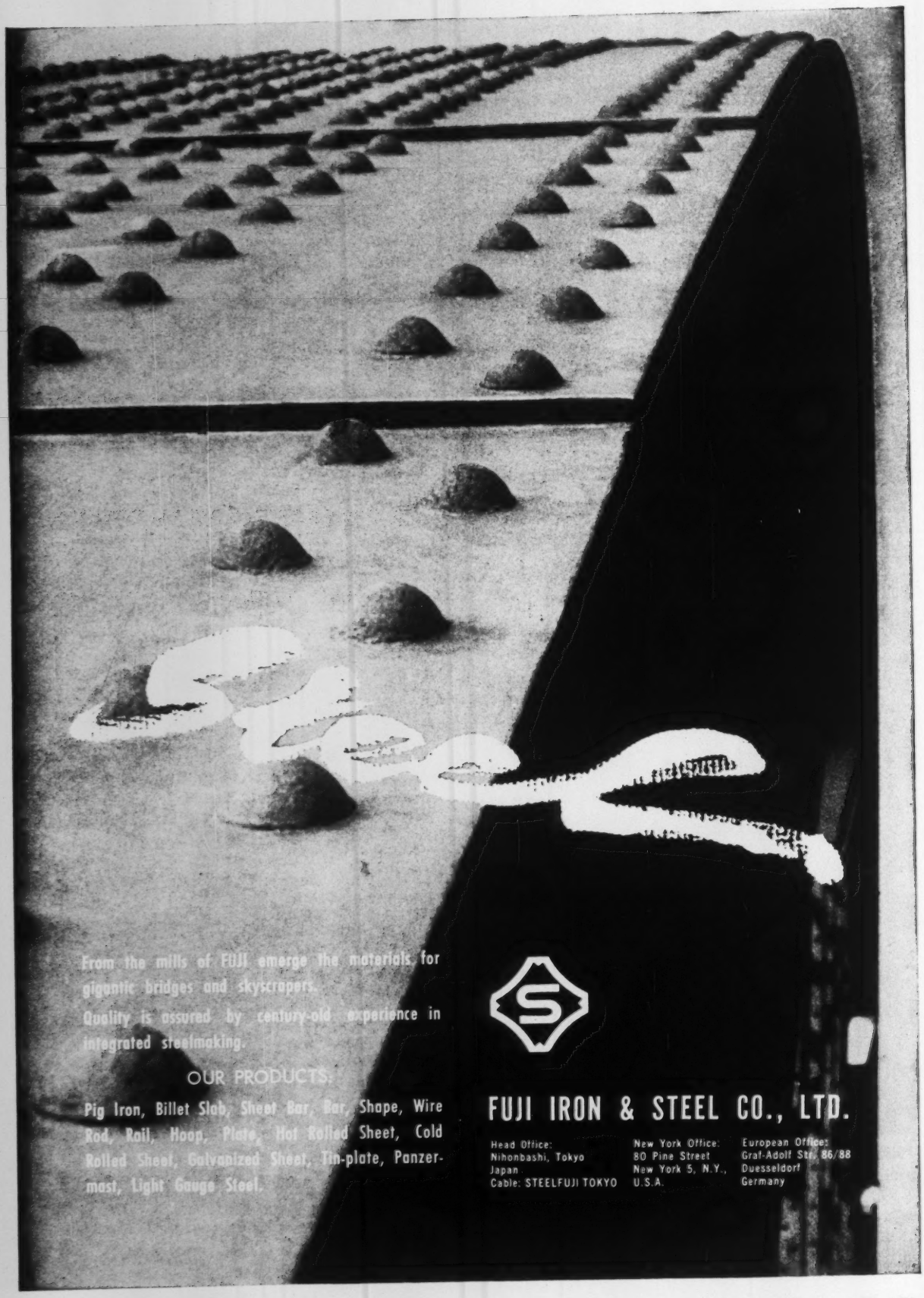
for bend ductility tests and punching test slugs

A compact unit with bench stand for permanent mounting on laboratory bench tip. Provides 35 tons thrust for bend test to determine bend ductility of uncoated steel stock or the adherence and ductility of sheet coatings. Capacity up to .164 mild steel. Interchangeable punch tooling produces undistorted 3½" diameter blank slug from mild steel up to .067.

Available complete with power unit.

Write for Complete Information

MANCO Mfg. Co., BRADLEY, ILLINOIS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Quality is assured by century-old experience in integrated steelmaking.
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COMING EXHIBITS

National Chemical Show—Sept. 5-8, International Amphitheatre, Chicago. (Chicago Section, American Chemical Society, 86 E. Randolph St., Chicago 1.)

Industrial Building Exposition—Sept. 25-28, New York Coliseum.

Fleet Maintenance Exposition—Oct. 23-26, New York Coliseum.

Detroit Metal Show—October 23-27, Cobo Hall, American Society for Metals.

Marine Supplies & Equipment Show—Nov. 15-17, Hotel Roosevelt, New York City.

MEETINGS

AUGUST

American Institute of Electrical Engineers — Pacific general meeting, August 23-25, Hotel Utah, Salt Lake City, Utah.

American Society of Mechanical Engineers — West Coast Conference, August 28-30, University of Washington, Seattle, Washington.

Metallurgical Society of AIME—Semiconductors conference, Aug. 30-Sept. 1, Ambassador Hotel, Los Angeles. Society headquarters, 29 W. 39th St., New York.

SEPTEMBER

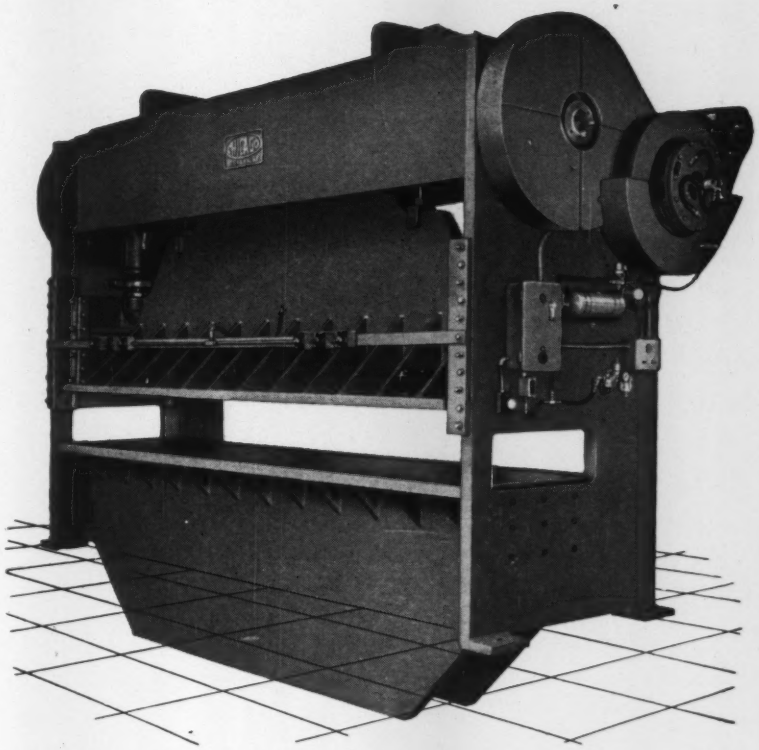
National Assn., Secondary Material Industries—New England Div. meeting, Sept. 7, Sheraton-Plaza Hotel, Boston, Mass. Assn. headquarters, 271 Madison Ave., New York 16.

Air Moving and Conditioning Assn., Inc.—Annual meeting, Sept. 10-14, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, Guardian Bldg., Detroit.

International Industrial Conference—Sept. 11-15, Masonic Memorial Auditorium, San Francisco.

Society of Plastic Engineers, Inc.—Regional Technical Conference, Sept. 12, Central Indiana Section, Severin Hotel, Indianapolis.

(Continued on P. 24)



CHICAGO DREIS & KRUMP

PRESSES
STRAIGHT-SIDE TYPE

large die area
capacities up to 400 tons

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

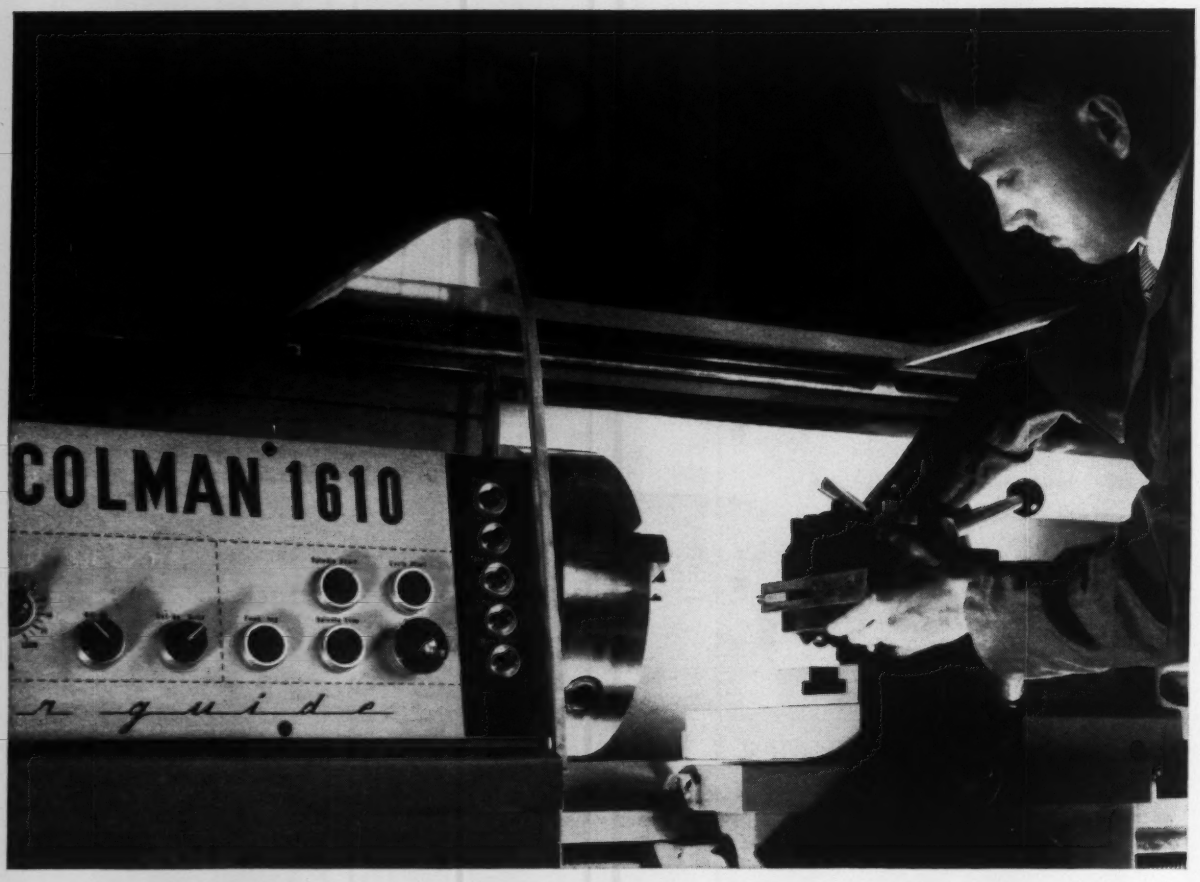
Complete recommendations for any job on request.

8674

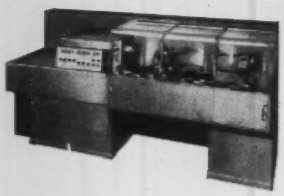
CHICAGO DREIS & KRUMP

Press Brakes · Straight-Side-Type Presses · Press Brake Dies
Hand and Power Bending Brakes · Special Metal-Forming Machines

DREIS & KRUMP MANUFACTURING CO.
7430 South Loomis Boulevard, Chicago 36, Illinois



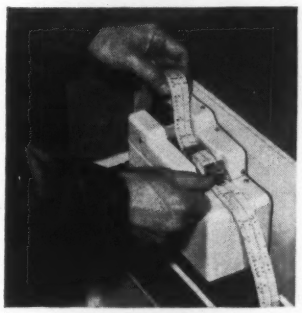
The Tape-r-guide can cut 700 different step-free tapers; can do cutoff and boring as well as internal or external step-turning; can form simple radii or chamfers—all under tape, without special tools.



TAPE

■ Increasing cutting speeds may squeeze a few pennies out of your direct costs . . . but numerical control is the way to chop dollars out of TOTAL COST. That's why the Tape-r-guide lathe, which combines all of the benefits of numerical control with the simplicity and economy of a MECHANICAL machine, is one of the most profitable investments you can make. For instance—lot-size economics and delivery requirements *add* to your finished and in-process inventories. These inventories cost

your company 18% to 25% of their value annually and tie up operating capital. The Tape-r-guide... so practical and versatile



you can set up and machine complex parts *in short runs*... gets to the heart of this problem. More people can devote more time to *production*—less time to part-handling, record-keeping, part-protection, storage, and design of gimcrack tooling. Costly templates and form tools are eliminated. There's no cut-and-try scrap. *Average* machine *operators* can learn to do a variety of jobs easily and quickly. Cutting tools can be preset in quick-change holders. You don't have to use machine tools to do what tooling and gages can do *better* at lower cost. You can estimate your costs accurately. Methods

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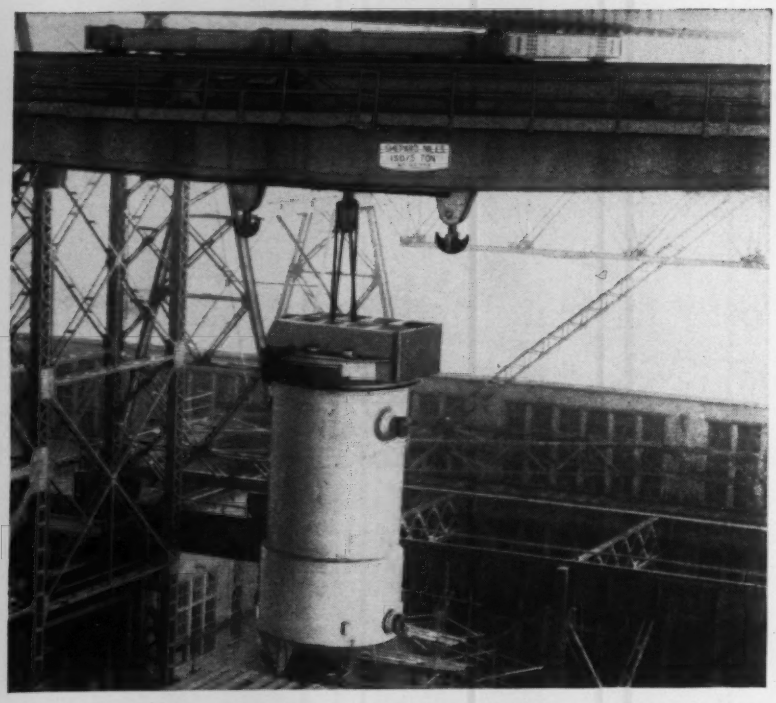
22-year-old Shepard Niles Job-Mated Crane is as good as new



Installed in 1939, this 150-ton Shepard Niles JOB-MATED Crane, with auxiliary hoist, was used to lower the nuclear reactor into the hold of the world's first atomic-powered freighter, the N.S. Savannah. Reactor was lowered (with only 2 inches to spare at the sides) ¼-inch at a time for the last four inches. (Photo courtesy of New York Shipbuilding Corp., Camden, New Jersey, subsidiary of Merritt-Chapman & Scott Corp.)

This Shepard Niles QUALITY Job-Mated Crane contains Shepard Niles-designed and -built components. We don't say these components won't wear out. Eventually, they will. But you'll find, as have many of our customers, that the extra years of service they give more than offset their initial cost.

No matter how long you use a Shepard Niles Job-Mated Crane, replacement parts are always obtainable. You make the choice as to how many years you want to operate it; the decision won't be made for you by early breakdowns, loss of efficiency, or lack of replacement parts.

A Shepard Niles Job-Mated Crane is just what you need for your load-moving operation. For the complete story, ask to have a Shepard Niles representative call at your convenience, or write for our descriptive bulletin.

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MEETINGS

(Continued from P. 21)

Non - Ferrous Founders Society — Annual meeting, Sept. 17-21, Shawnee Inn, Shawnee-on-the-Delaware, Pa. Society headquarters, University Bldg., 1604 Chicago Ave., Evanston, Ill.

AEC Welding Forum — Annual meeting (classified), Sept. 20-22, Southwest Research Institute. Institute headquarters, Granada Hotel, San Antonio, Texas.

Industrial Electronics Symposium —Sept. 21-22, Bradford Hotel, Boston. Institute headquarters, 51 East 42nd Street, New York 17.

Pressed Metal Institute — Annual meeting, Sept. 24-28, The Grand Hotel, Point Clear, Ala. Institute headquarters, 3673 Lee Rd., Cleveland.

American Welding Society — Fall meeting, Sept. 25-28, Adolphus Hotel, Dallas, Texas. Society headquarters, 33 W. 29th St., New York.

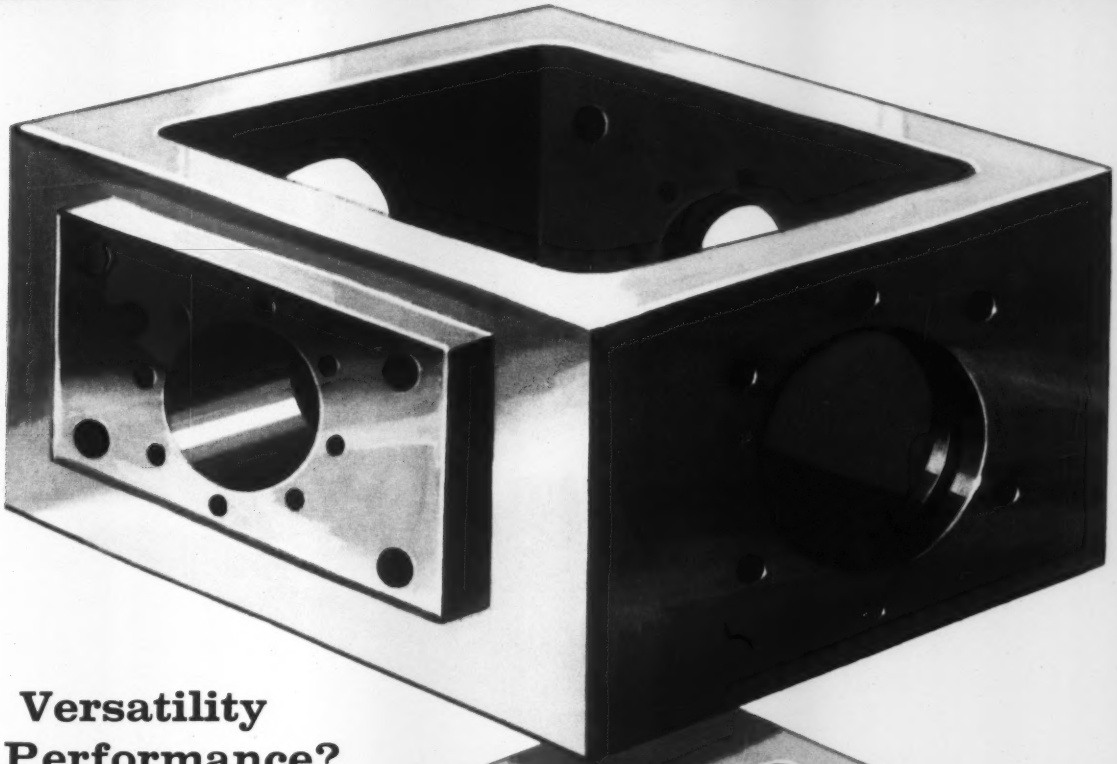
Assn. of Iron and Steel Engineers —Annual convention, Sept. 25-28, Penn - Sheraton Hotel, Pittsburgh. Assn. headquarters, 1010 Empire Bldg., Pittsburgh, Pa.

Steel Founders' Society of America —Annual Meeting, September 25-26, The Homestead, Hot Springs, Virginia.

American Die Casting Institute Inc. and The Die Casting Research Foundation—Annual meeting, Sept. 27-28, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.

American Production and Invetory Control Society — Annual national conference and technical exhibit, Sept. 28-29, Pick-Congress Hotel, Chicago. Society headquarters, 330 S. Wells St., Chicago 6.

Purchasing Agents Assn. — 14th Pacific Inter-Mountain Conference, Sept. 29-30, Westward Ho Hotel, Phoenix, Arizona.



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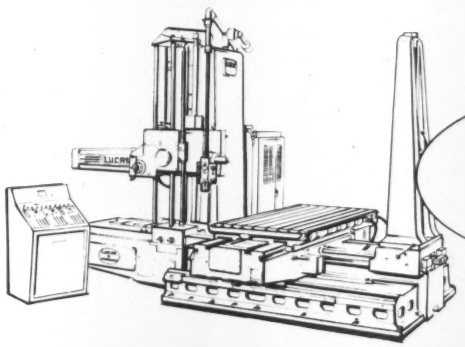
If your replacement or expansion plans include the addition of either vertical or horizontal table type or floor type boring, drilling and milling equipment, get the details on what Lucas has to offer. Lucas Machine Division, The New Britain Machine Company, 12302 Kirby Avenue, Cleveland, Ohio.



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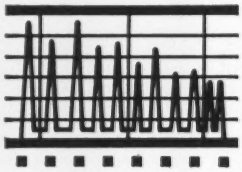
or a chart 

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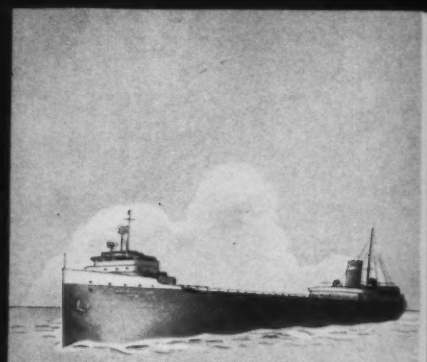
Forged Steel Shafting Adds New Life to Great Lakes Carrier

11 tons of forged steel machined to less than .002" tolerance



Machining holes for connection between thrust and crankshafts.

Photos courtesy
Fraser-Nelson Shipbuilding and Dry Dock Co., Inc.
Superior, Wisconsin

Connecting the forged steel thrust shaft and 3-throw crankshaft at Fraser-Nelson Shipbuilding and Dry Dock Company, Inc., Superior, Wisconsin.

This 11-ton 30-foot forged steel shaft assembly readies the Midland Steamship Lines carrier, Michael K. Tewksbury, to do battle against the buffeting waves of the Great Lakes. The one-piece crankshaft was twisted and machined to less than .002" tolerance along with the thrust shaft at Erie Forge & Steel Corporation. These components replace the drive system powered by an 1800 hp. triple-expansion steam engine . . . new service life for this veteran Great Lakes ore and grain carrier.

Here, at Erie Forge & Steel Corporation, continuous quality control procedures direct the work of skilled craftsmen from order to shipping dock.

Your requirements for quality forged and cast steel components are a challenge which we welcome — consult with us in full confidence that we will serve you well.

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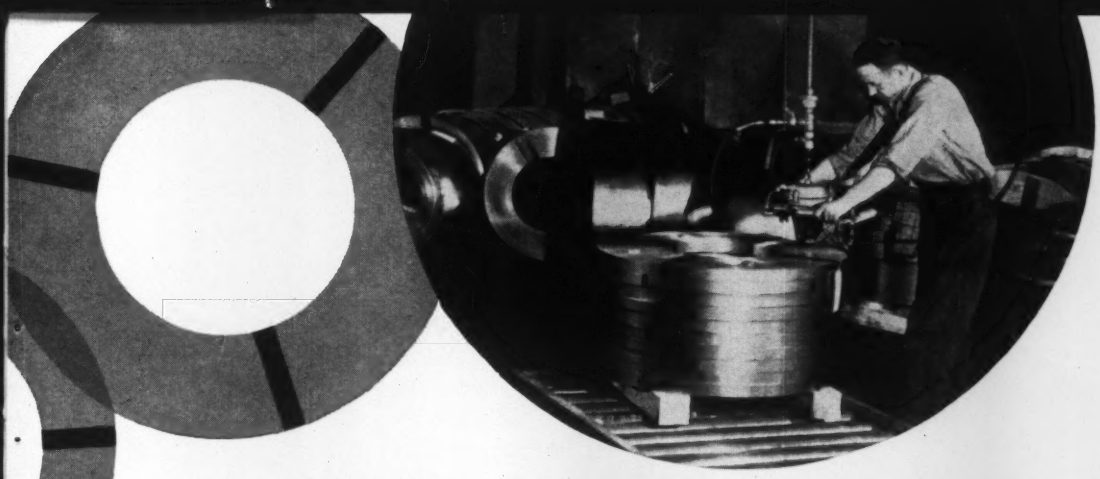

ACME STEEL MACHINES STRAP CIRCLES AROUND ANY OTHER METHOD

In the slit coil field alone, dozens of producers are proving that Acme Steel automatic strapping systems are the most productive partner slitting equipment ever had. For instance, the new F4 Strapping Machine and Indexing Table (at left) let one man completely strap as many as 150 coils *of any width* per hour—all through push-button control. And once secured, coils are unitized just as efficiently with Acme Steel portable powered strapping tools.

Thanks to this rapid, non-stop flow, existing slitting equipment can run *continuously* at full capacity, eliminating the need for investing in additional slitting lines in many instances. No wonder Acme Steel automatic strapping equipment can pay off in 18 months!

No field has a monopoly on these savings. Acme Steel equipment is scoring unparalleled productivity gains in strapping giant hot coils, paper, textiles, products and packages of every description . . . in bundling and unitizing such products as lumber, building materials, bar stock, pipe and sheet metals.

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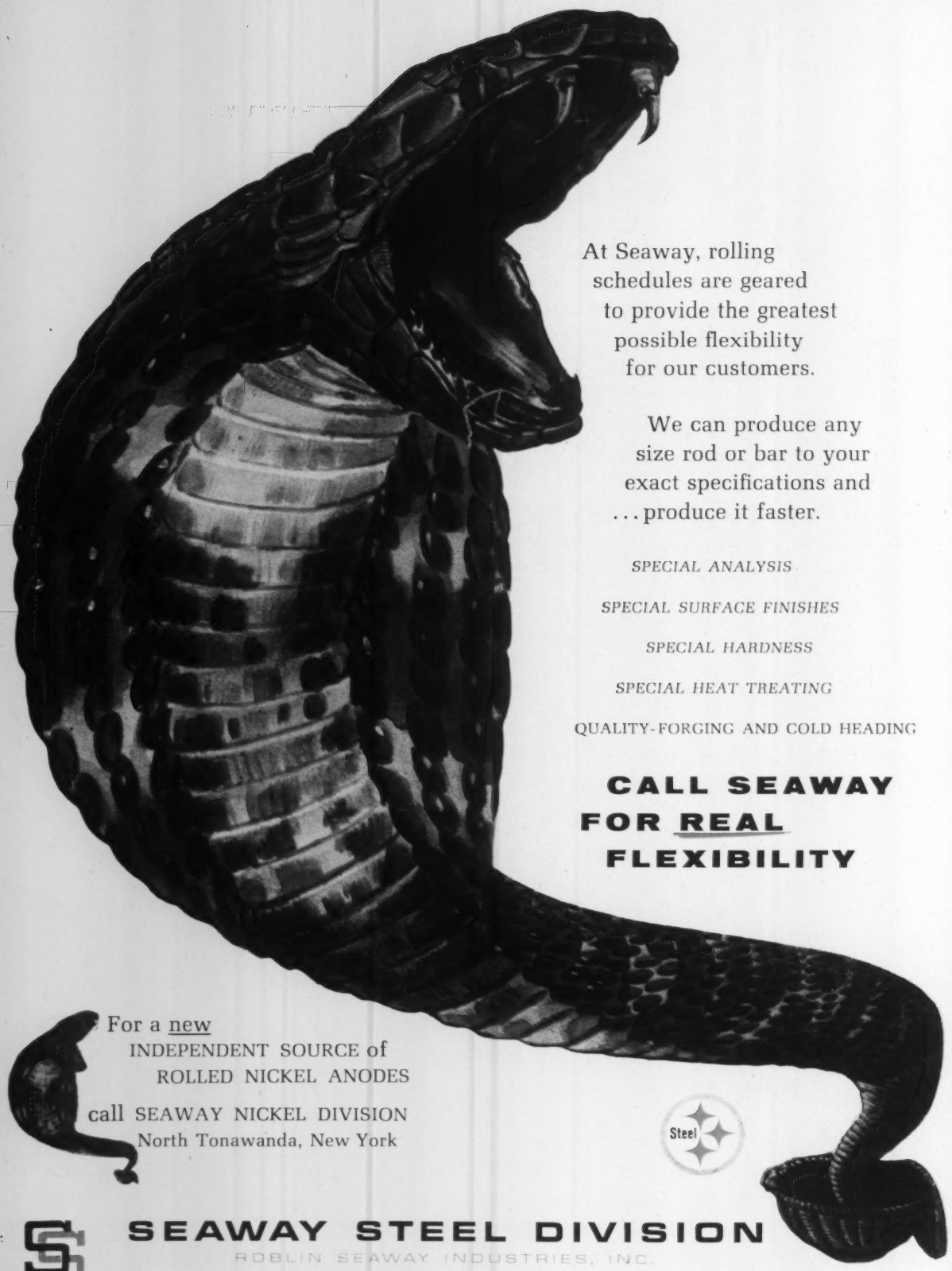

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STEEL MILLS ARE REVIEWING the axiom that profits increase with the amount of finishing. Climbing labor costs, along with sweeping effiency gains for melt operations, make some feel it may be better to push products that require relatively little finishing. One producer is thinking along these lines for stainless, where finishing costs are high.

ALUMINUM PRODUCERS continue to plug away at high speed extrusion as a means of cracking beer can and other markets calling for tall containers. One mill is said to have installed a press designed to make 200 units a minute. Speeds up to 240 a minute are being mentioned for presses for single cans, and up to 400 per minute for units that extrude in pairs.

U. S. ASSEMBLY LINES are rated tops in efficiency. But recent research suggests the average appliance assembly line operates 15 pct under optimum. TV assembly lines run 5 pct under optimum. And auto lines do little better than 20 pct under optimum.

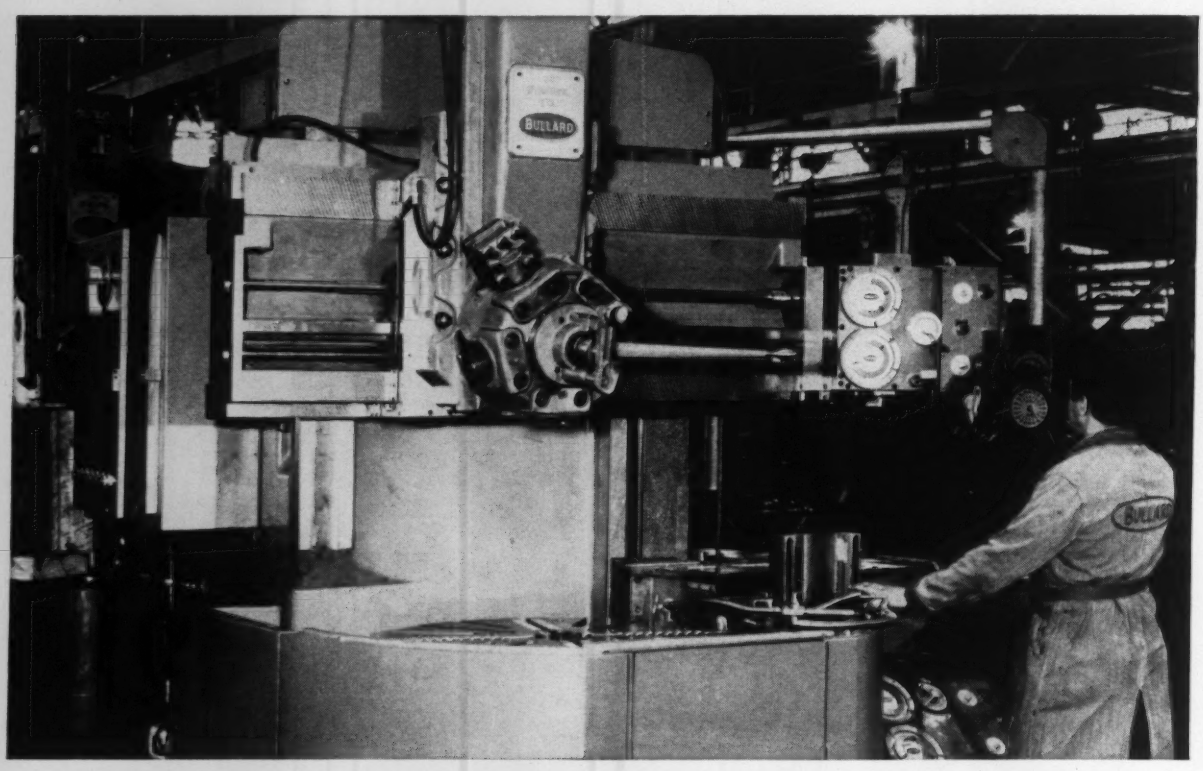
THE DEFENSE DEPARTMENT WILL SPEND $16.1 billion on major procurement and production in the fiscal year ending June 30, 1962. This is $1.2 billion more than last year. Here's where big chunks of the spending will go: Aircraft, $6.5 billion; missiles, $4.4 billion; ships, $1.9 billion; ordinance, vehicles and related equipment, $1.5 billion; electronics, $1.2 billion.

STAINLESS STEEL SHIPMENTS will top 1 million tons a year in the current decade, says E. J. Hanley, president, Allegheny Ludlum Steel Corp. He sees the market growing at the rate of 4 to 5 pct a year. In 1959, 610,000 tons were shipped by U. S. mills.

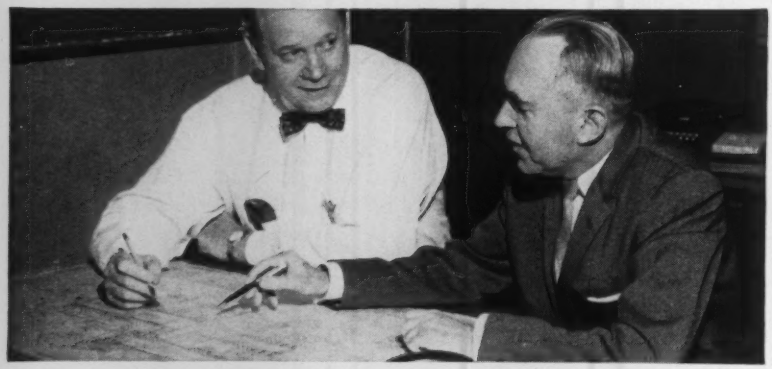
BUILDING PRODUCT MAKERS often "lack the specialized sales and distribution machinery to handle the large and growing volume of business from remodelers." This is the view of a leading remodeler. The business, now a $13 billion annual one, is up from $8.7 billion in 1958. Remodelers say their business is "separate from home building, and must be treated as such."

CONSTRUCTION EQUIPMENT manufacturers will get a boost from the 1961 Federal aid highway program--but not until fiscal 1963. This is due to the "delayed impact" of the new Highway Act, says the Machinery and Allied Products Institute.

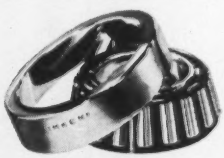
New Bullard V.T.L. fully powered for high production:
Has Timken® bearings for high precision



The first fully-powered vertical turret lathe, this Bullard Dynatrol® is designed to increase machine speed and output. Dynatrol provides single lever or remote control of all head motions, traverse and feed engagement. To assure precision, Bullard uses Timken® tapered roller bearings at vital points—table radial position, headstock, clutch shaft, input pulley, rail raising bracket. Their taper lets Timken bearings take *any* combination of radial and thrust loads. In the headstock, for example, Timken bearings hold shafts in proper position for smooth gear mesh and power transmission. And precision manufacture of Timken tapered roller bearings assures high precision in the machine.



ENGINEERING SERVICE THAT SAVES YOU TIME AND MONEY. Working with you at the design stage, our sales engineers can often solve your bearing problems on the spot. From the wide range of Timken bearing sizes, types and precisions they can help you select the Timken bearings to give you the maximum in efficient, economical design engineering.



Industry rolls on

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Auto Talks Enter Critical Week

Big Three Must Come Up With Offer or Face Strike

There has been little evidence of progress through the first six weeks of auto labor talks.

But the Big Three must come up with its first offer soon. Contracts expire Aug. 31.
By A. E. Fleming

■ Contract talks between the Big Three automakers and the United Auto Workers Union are at the "will they, or won't they" stage. And the answer is only one week away.

UAW contracts with General Motors Corp., Ford Motor Co. and Chrysler Corp. all expire at midnight, Aug. 31.

UAW Smorgasbord — There has been little evidence of progress through the first six weeks of negotiations. The automakers have viewed —with caution and suspicion—the union's smorgasbord of proposals and demands.

They've found little that's palatable, much less appetizing. But, outwardly at least, the automakers are confident that the contract cooks can come up with something for the table that will satisfy everybody before the party breaks up.

Ford's chief negotiator, M. M. Cummins, predicts the company and union will settle by August 31. UAW counterparts are less confident, pointing to a "deplorable lack of progress."

"Blue-Plate Special"—Up to now the give and take can be described as a dead heat. Things should perk up this week. A reappearance of Mr. Reuther was awaited as American Motors Corp. and the UAW resumed conversation for the first time since the compact automaker unveiled to everyone's amazement a profit-sharing "Blue-Plate Special" several weeks ago.

Mr. Reuther has not stepped into the open since launching Big Three talks in June. His appearance at AM would indicate an interest in the profit-sharing plan.

The UAW president was expected to have a counter-proposal ready for the company which, after getting below pattern settlements in 1955 and 1958, suddenly took the lead in 1961 negotiations.

Time to Chew on It—The union will not swallow AM's offering whole. There are too many strings attached. AM will have two weeks to study the union's comeback offer since its contract runs out Sept. 6.

What the UAW accepts and what it rejects of AM's package, or what modifications are suggested, will be examined closely by the Big Three. But they will have less time to review the UAW-AM bargaining outcome. With the union rattling its strike sabres as the Aug. 31 date approaches, pressure will be more severe than ever.

Has Bitter Flavor — The Big Three is not likely to go along with a profit-sharing scheme, even if one ultimately winds up in AM's contract. Turned down flat three years ago, profit sharing is no more appealing to the large producers today.

It will be the task of Big Three negotiators to concoct something that may be equally alluring—a money offer or an economic principle which Mr. Reuther has been promoting.

The Big Three are determined to

AT THE TABLE: Norman Matthews (left), UAW's American Motors director, and Walter P. Reuther, UAW president, have key roles in auto talks this week. Mr. Matthews also heads union team at Chrysler Corp.

try to hold boosts in wage and fringe benefits to 2.5 pct or 7 cents an hour annually. They also would like to shake off the improvement factor and cost-of-living clauses.

By The Hour—Chrysler already has told the UAW that salaries for hourly workers are out, that they cannot even be considered. This was the first stand by a Big Three company. GM and Ford were expected to nod in agreement, so salaries seem out of the question. Chrysler, however, is the only one with a big UAW white-collar membership, having 7000 on salary.

A Big Three offer is expected to include improvements in supplemental unemployment benefits, pensions, severance pay and other fringe items.

The Tips Add Up — UAW is anxious to keep the improvement factor and C-O-L. Although a 7-cent-an-hour annual wage hike over three years would about match these benefits, the union doesn't want to yield the principles that currently are worth $1.18 an hour.

Meantime, Mr. Reuther keeps saying he is not looking for agreements which would cause price increases and resulting inflationary pressure on the economy. But he wants something that will capture the imagination of the public and other labor leaders.

Pressing for profit sharing at the Big Three is what Mr. Reuther is not likely to do. It would meet with stubborn resistance, perhaps leading to a prolonged strike and subsequent Federal intervention.

Only an Ax?—Rather, he may use profit sharing as a cleaver to hang over the industry to help gain other concessions. Presumably, Mr. Reuther would be satisfied with either an automation fund, reduction of work time by paid sabbaticals, longer holidays or a shorter work week, a hike in SUB payments, earlier retirement, relocation allowances for workers forced to move with their jobs, or full company payment of hospitalization insurance premiums—plus money.

The question intriguing many people is which Big Three company will make the first offer. The UAW looks for GM to make the move. This is where most union weight has been thrown.

Which Will It Be?—Each of the union's Big Three department heads, Leonard Woodcock (GM), Ken Bannon (Ford) and Norman Matthews (Chrysler) has been pushing to make his company the main target in case of a strike.

GM is favored because the outcome of a settlement there would be the most significant. And if the Federal government moves into the negotiations, it is believed the UAW would as soon thrash things out in Washington with GM as with the smaller companies.

Cost Accounting — Mr. Woodcock has been hounding GM to open its books on price-profit policies. He contends that GM sets prices to produce a 20 pct profit based on 180 days of annual production. Washington might make a good sounding board for this.

Perhaps the $42 million the UAW will have in its strike fund Sept. 1 will influence the selection of a strike victim. The money would last longer with Chrysler Corp., which has 60,000 UAW members, than at Ford (120,000) or GM (310,000).

But rough play at Chrysler could throw a wrench into the company's hoped-for 1962 comeback, something Mr. Reuther wouldn't like to be blamed for. Besides, neither GM nor Ford would attach significance to a Chrysler settlement if it led to higher labor costs or was otherwise unacceptable.

The Vigil—Mr. Reuther says the 24-man UAW executive board will wait until Aug. 29 to name the strike candidate. He warns that a strike at the Big Three would be effective at the end of the contract date, August 31.

But it is possible that if bargaining is moving smoothly on Aug. 31, the union might agree to a day-by-day renewal arrangement. The UAW probably wouldn't be too patient. And Mr. Woodcock warns that a settlement at the national level by Aug. 31 does not necessarily mean labor peace in every GM plant.

Six years ago, the UAW and the automakers agreed to finish up local problems when the national settlement was made. This time all problems at all levels must be solved through negotiations, says Mr. Woodcock.

Holiday Pay — A strike before Labor Day is not expected. Higher strike benefits do not go into effect until Sept. 3 and 4. Also, Labor Day is a paid holiday. It could be the union will extend the bargaining a week. And, if a settlement does not appear imminent by then, authorize walkouts at the target company.

Length of time a strike might last is another puzzler. Guesses in Detroit range from a few days to a couple weeks. One week is the most popular choice.

Time Element — The possibility of intervention by Labor Secretary Goldberg would tend to hasten settlement. Neither the union nor the auto companies want this.

Running against the automakers, also, is the timing of a strike. Public introduction of 1962 models is set to take place from mid-September to mid-October.

Low Inventories—This lends increasing importance to new car sales and inventories. And it injects them into the bargaining scene. By Sept. 1 there will be 650,000 cars in inventory, including only 100,000 new 1962's. At the same time last year the inventory was nearly 900,000.

Second Front — As negotiations continue, they are being followed closely by auto parts manufacturers to find out what the automakers will provide the UAW. The suppliers know they will probably have to match the contract later.

The UAW opened negotiations with suppliers Aug. 16. Demands at Bendix Corp. and Budd Mfg. Co. were practically the same as those made to automakers.

Industry Men Shun Tariff Talk

Steel, Aluminum Spokesmen Want World Markets

House subcommittee hears aluminum and steel spokesmen on impact of imports on employment.

Most avoid protectionist tag, ask other forms of aid to combat rising import trend.
By R. D. Raddant

TARIFF TALK: R. Conrad Cooper, right, discusses committee testimony with ranking Republican Kearns, left, and chairman Dent, at House hearing.

■ Protectionists in Congress are receiving little encouragement from the aluminum and steel industries.

Producers are not against government help in fighting the inroads of imports. But they are looking past protectionists tariffs toward world markets. They are not satisfied with merely holding their own behind tariff walls at home.

What They Want—Instead, they ask more sophisticated aid in new depreciation policies, help in breaking down trade barriers abroad, and cooperation from labor unions in improving production efficiency.

This is a general conclusion drawn from hearings last week before a House subcommittee. Headed by Congressman John H. Dent (D.-Pa.), the group is probing the impact of imports and exports on American employment. Hearings were aimed at aluminum and steel.

Committee Intent — Industry spokesmen avoided the question of tariffs where they could. This is in spite of obvious committee intent to build a case for higher tariffs and curtailing imports by either tariffs or quotas. Congressman Dent is joined by ranking minority member Congressman C. D. Kearns, (R.-Pa.) as foes of free trade where it hurts employment and industry.

R. Conrad Cooper, executive vice president, U. S. Steel Corp. conceded "many disturbing currents," that "jobs in the steel industry have been lost or not provided as a result," and that the trend is a threat for the future.

Case for Depreciation—He cited higher comparative costs of labor in the U. S. and a narrowing in the U. S. industry's competitive advantage because of more modern equipment abroad.

"One important way in which our government can promote economic growth and modernization is by correcting the inadequacy of depreciation amounts allowed in taxable income," Mr. Cooper charged.

Nor did the subcommittee get much help from the union side. Speaking for the United Steelworkers, Meyer Bernstein, international affairs director of the USWA, said: "The real trouble in steel is not imports, but business conditions at home."

Aluminum Viewpoint — Aluminum spokesmen also can recite imposing statistics of jobs lost to imports. "To the extent that imports enter, they cause unemployment in U. S. plants which can turn out additional tonnages of these same aluminum products," said Irving Lipkowitz, director of economic affairs for Reynolds Metals Co.

But he said emphasis on market development is the healthiest and most lasting solution to the problem of excess supply over demand. This world excess of supply is a major concern of all aluminum people.

Tariffs Abroad—L. P. Favorite, vice president of Aluminum Co. of America, said the government could best help the American industry by obtaining a reduction of primary aluminum tariffs in Western Europe.

"While the United States heads for freer trade, other large trading areas of the world are intent on building up barriers designed to exclude American products," Mr. Favorite charged.

New Lab Controls Koppers Research

■ Another monument to new knowledge comes on stream this week with the dedication of an $8 million research center by Koppers Co., Inc.

Located at Monroeville, Pa., it will be the administrative headquarters for overall Koppers research. It will provide laboratory scale research for the company's plastics, tar products, chemical and dyestuffs divisions.

In addition, the Monroeville center will devote about 25 pct of its effort to broad, exploratory projects.

General Science—It will house mathematics, physical testing and other general science groups. It has the latest scientific instruments and a big technical library.

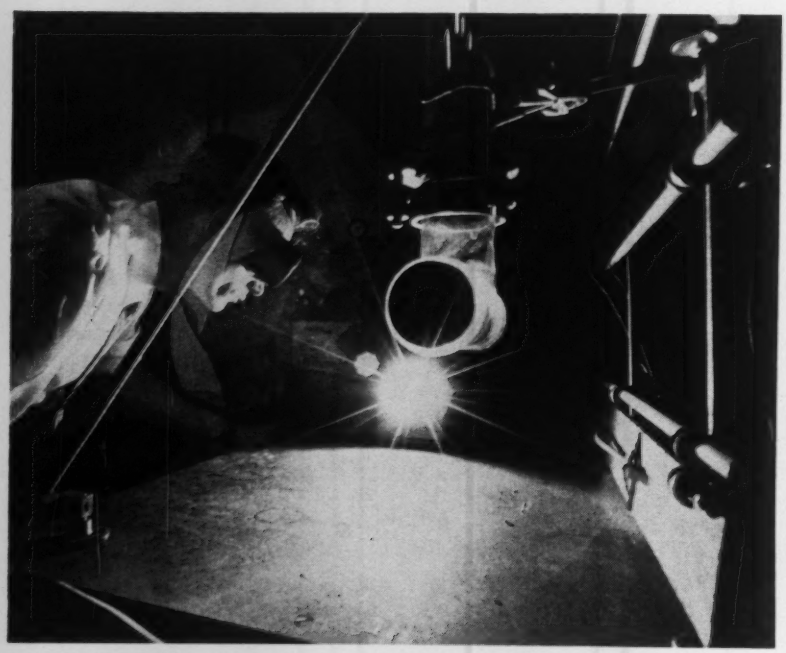
The Koppers center points up the new importance and glamor of industrial research. It is one of many elegant labs that have been springing up around Pittsburgh.

Why the Move—A look at the Koppers installation explains why industry has been building big research centers.

Individual instruments for a modern lab can cost $60,000 or more. Mathematicians are essential. The Koppers library takes up two floors; and the company is providing a high speed computer.

Not Rigid—Koppers has not attempted a rigid centralization of research for its product array.

Laboratory work on chemicals and allied products is done at Monroeville. Pilot plant projects for all Koppers divisions have been left at Verona, Pa., in the old research center. Research on coke ovens, electrostatic precipitators and other heavy construction items is also done at Verona.



BASIC CENTER: A plasma jet unit can produce 25,000°F temperatures at a research center and pilot plant of Koppers Co., Inc.

Why Producers Study Continuous Casting

The role of continuous casting in this country is starting to take shape.

Recent moves indicate the process will be used first by smaller mills as a means of increasing efficiency. The larger mills are seen turning to the process initially as a means of scaling down expansion increments.

Canadian Move—The first part of this projection has been nailed down more firmly with word of a new Canadian installation. Premier Steel Mills, Ltd., is adding a two-strand billet casting machine at Edmonton, Alberta.

Operating in a two furnace, electric melting shop, the machine will process steel for 75,000 tons of finished products a year. Reinforcing bars, merchant bars, and low alloy specialties are made by Premier Steel.

Koppers of Canada, Ltd., will design and supply the casting unit. Provision has been made for expansion to four strands at a later date.

Fits Into Pattern — Premier's move fits into the pattern that has recently emerged for continuous casting on this continent. Roanoke Electric Steel Corp. is presently installing an experimental unit under an agreement with Babcock & Wilcox Co. Aceros Chihuahua is due to start operating a Mexican plant built by Koppers Co. At least one small producer of reinforcing bars is reported ready to move on continuous casting. Others are showing strong interest.

In all these cases, continuous casting is being applied, or considered, for relatively small tonnages of steel. Many of the hottest prospects in this country are rebar producers who melt scrap in small electric furnaces and operate in outlying markets.

In this kind of situation, there is not nearly the volume to justify conventional primary mills. As the Premier Steel figures indicate, con-

tinuous casting can be tailored to limited quantities. And the process makes economic sense for low volume operation. It increases yields, improves quality, and can be installed at a moderate cost.

Watchful Waiting — The larger mills in this country are in a state of watchful waiting on continuous casting. One of the biggest is building a king-sized pilot plant. Most of the others are checking British and European installations.

No one appears ready to move but there is strong interest. According to one specialist, it has been established that virtually any kind of steel can be cast successfully. A 10 pct yield increase can be counted on, says this source; progressive solidification gives improved quality.

Finally, the large producers see in continuous casting a means of expanding in smaller steps. A number of mills are approaching the point where they need more primary rolling capacity. However, they are not at all sure they are going to need the 2 to 3 million tons represented by a modern slabbing mill.

Part of a Whole — What these mills would like is one-third or one-fourth of a complete rolling mill. They think continuous casting may be the answer to this need for about 250,000 tons of primary capacity. However, they would like to see more practical experience with the process on this kind of volume.

Court Will Interpret Price Discrimination

The U.S. Supreme Court is being asked again to rule on the scope of the so-called "good faith" defense to price discrimination.

The Federal Trade Commission says the "good faith" defense is not legal. A lower court maintains it is. The Supreme Court will rule on this new case in its October session.

The FTC has been trying for some time to get the "good faith" principle killed. If it loses this round with the Supreme Court, it may ask Congress to bury the principle.

THE RIGHT CONNECTION: Visiting Australian industrialists Geoffrey Major (right) and his nephew Peter (left) view a burner connection with James S. Shute, Export Div. manager, Selas Corp., at Dresher, Pa.

Australia Perks Up

■ "Australia," to quote an officer of the English, Scottish and Australian Bank Ltd., "is going places in a big way."

Well, perhaps not big by U. S. standards, because the island has a population of just over 10 million on a land mass the size of continental USA.

But interesting—from a business viewpoint; enough to warrant U. S. investment of more than $600 million there since 1948. Some 900 U. S. companies have Australian connections. Over 200 have subsidiaries or joint ventures there.

Humming Again — Or listen to Geoffrey Major, an industrialist from Down Under: "We had a bit of a recession, just as you did in the States. But I think things are ready to start humming again now."

Mr. Major is managing director, Major Furnace & Combustion Engineers Pty, Ltd., Melbourne. His company, which employs about 250, is the newest licensee of Selas Corp., Dresher, Pa., manufacturers of heating and combustion equipment. Selas already has subsidiaries or licensees in Canada, Europe, South Africa and Asia.

Trade Troubles — Australia is admittedly protectionist. And like the home country, it has a balance of payments problem.

The result is to encourage home industry at the expense of imports. Exports of heat treating equipment to Southeast Asia are negligible, though Mr. Major sees a growing market there.

The economy is fairly stable. Even during the recent recession he estimates that unemployment never got above three pct.

Aluminum Leads — Its fastest growing industry? Aluminum production and fabrication, with building construction the number one market in the aluminum field.

Automatic handling in heating and heat treating? So far, reports Mr. Major, it has been confined to the aluminum and steel mills. "We haven't had much union trouble about automation," he adds.

"No doubt about it," said the Australian industrialist, who was in Philadelphia to discuss sales and engineering plans with Selas. "More U. S. firms are signing up Australian licensees."

INDUSTRIAL BRIEFS

Medal Winners — Three men from Chambersburg Engineering Co. will receive Edward Longstreth Medals at the October 18 Medal Day ceremonies of Franklin Institute, Philadelphia. They include R. L. Alcorn, Jr., Chambersburg research engineer; E. C. Clarke, former president and now director; and H. A. Weyer, chief engineer. They are being honored for their modern method of forging metal into parts by the "Impacter."

Seamless Section — American Iron & Steel Institute has formed a Seamless Specialty Tubing Producers Committee. It will promote the use of seamless tubing.

Bigger Quarters — Ohio Metallurgical Service, Inc., is building a new heat treating plant and laboratory at Elyria, O. It will have greatly increased capacity for heat treating, lab analysis, testing and metal finishing, according to W. D. Latiano, president.

Diamond Deal—Reed Roller Bit Co. has purchased Diamond Metal Co., Houston, Tex. Diamond makes tungsten carbide surfacing materials and castings.

Wider Control—Penn Controls, Inc., Goshen, Ind., has acquired Base, Inc., Milwaukee. Base makes automatic controls, switches and valves for gas-burning devices in industrial and domestic markets.

New Interest—Racine Hydraulic & Machinery, Inc., has acquired a one-third interest in Gettys Manufacturing Co., Racine, Wis. Gettys specializes in electronic and electromechanical systems.

Part Interest—American Metal Products Co., Detroit, has acquired a 21 pct interest in Briggs Manufacturing Co. AMP sold its stock in its wholly owned subsidiary, AllianceWare, Inc., to Crane Co. for cash plus 231,674 shares of Briggs stock held by Crane.

National Buy—Alloy Steels, Inc., Detroit, has acquired National Steel Co. of Chicago. The deal includes National's 35,000 sq ft carbon steel warehouse.

Rounded Line—Alloys Unlimited, Long Island City, N. Y., has acquired Ceramics for Industry Corp., Mineola, N. Y. It rounds out the position of Alloys Unlimited in the semiconductor field.

Aircraft Move—General Metals Corp., Burbank, Calif., has acquired the aircraft products business of Gladden Products Corp., Glendale, Calif. It includes lines of hydraulic and pneumatic components.

New Division—Instrument Systems Corp., College Point, N. Y., has acquired Cornwell Electronics Corp., Byram, Conn. Cornwell makes power control saturable core reactors, special transformers and magnetic amplifiers.

Modern Plant—Futurmill, Inc., Pontiac, Mich., has bought a new plant at Southfield, Mich. All milling and tooling operations have been transferred there.

Shift East—Voi-Shan Industries, Inc., Los Angeles, has acquired D-M-E Corp., Detroit supplier of standard mold bases and moldmakers' supplies for the plastic molding and die casting industries.

Further Growth—Fulton Industries, Inc., Atlanta, Ga., has acquired Dollin Corp., Irvington, N. J., producer of aluminum and zinc die castings. It will operate as a division of Precision Castings Co., one of Fulton's six divisions.

Deeper South — Granco Steel Products Co., St. Louis, has opened a district sales office at Tampa, Fla. It will market fabricated flat rolled steel products.

Main Move—Bradley-Sun Div., American Can Co., has moved its main office to Union, N. J.

Full Rights—Consolidated Astronautics, Inc., Long Island City, N. Y., has acquired all rights to manufacture air-stable titanium metal powder from United International Research, Inc., Newark, N. J. Consolidated will market the titanium powder and various derivations on an international basis.

Another State—R. D. Wood Co. is moving its general offices from Philadelphia to Florence, N. J. The company makes large hydraulic presses and allied equipment.

Branch Shift — Tractor Group, Allis-Chalmers Manufacturing Co., has moved its Indianapolis branch to a new building on a 10-acre site at Franklin, Ind. It will permit full use of lift truck operation and palletized storage bins.

Modern Center—Xerox Corp. is building a $1.5 million distribution center at the company's 400-acre site at Webster, N. Y. It will be used to store and handle raw materials and xerographic plate and drum products.

Four More—Huck Manufacturing Co., Detroit manufacturer of precision fasteners and fastening tools, has opened four new regional sales and engineering offices at Atlanta, Chicago, St. Louis, and Newark, N. J.

Rocket Region—Thiokol Chemical Corp., Bristol, Pa., has opened a new Rocket Operations Div. regional office at Cocoa Beach, Fla. It will coordinate all rocket group operations in the Florida area.

Advanced Plant—Magnetics Div., Automation Industries, Inc., has moved to a new plant at Boulder, Colo. It will develop and manufacture technically sophisticated foil and wire magnetics components for aircraft, missile and advanced lab applications.

Master Move — Metal Masters Co., designers and builders of special industrial machines and equipment, has moved to new and larger quarters at 2601 W. Diversey Ave., Chicago.

Some Questions Managers Face

International tensions will have an important impact on management decisions.

They are only one of the new factors which must be considered from now on.

■ Changes in the economy will shape management thinking in the months ahead.

A growing number of influences will affect business planning. Some include: The critical international situation, the rise in Federal spending for defense, shifts in markets, and the prospect of inflation.

Defense Spending Impact—How much impact the upsurge in defense spending will have on the economy is not yet clear. But the proposed additional $3.5 billion in military funds could be inflationary. This will put emphasis on industrial pricing and spending for new plants and equipment.

Some economists are already urging industry to move ahead with capital spending plans before costs go up. Even without this stimulus, business spending for fixed investment is on the rise.

Outlays for both private nonresidential construction and producers' durable goods went up in the second quarter. An increase in profits also encouraged industry to boost investments in capital equipment.

Price Pressure—Whether more Federal spending and a general improvement in business will bring price increases is not clear. There already is some pressure on industrial prices. The steel industry, for instance, has gone over three years without a major price increase, despite rising wage costs.

How much total defense spending will rise is another unanswered question. During the Korean buildup, for example, Federal outlays advanced $21 billion in 1951 and $16 billion in 1952. At that time the economy was only two-thirds as large as today.

Five Billion Higher?—Concerning the immediate future, the Federal Reserve Bank of New York points out in its August review, "Defense expenditures during the next year or two seem almost certain to be more than $5 billion higher than at present."

Despite the tensions at Berlin and elsewhere, one trend continues undiminished: The internationalization of business. More and more companies are linking themselves with overseas producers to market each other's equipment, exchange designs, and technical knowledge. The management of any U. S. company with an interest in world markets will find it difficult to ignore this trend.

How to Organize for Results

■ Sound organization isn't an accident. And much that passes for organization can be a waste of time.

In the current American Management Assn. News, Col. Lyndall F. Urwick, chairman, Urwick, Orr & Partners, Ltd., points out some of the signs that identify a sound organization.

Arrange and Correlate—He explains first there is a difference between organization and motivating and integrating groups. Both are a part of management. But organization has to do with arranging and correlating the tasks in a group.

"When we mix our thinking about organization with attempts to solve the 'people problems' of motivating and integrating, we fail to do either job properly."

What to Include—A sound pattern of organization should include these characteristics:

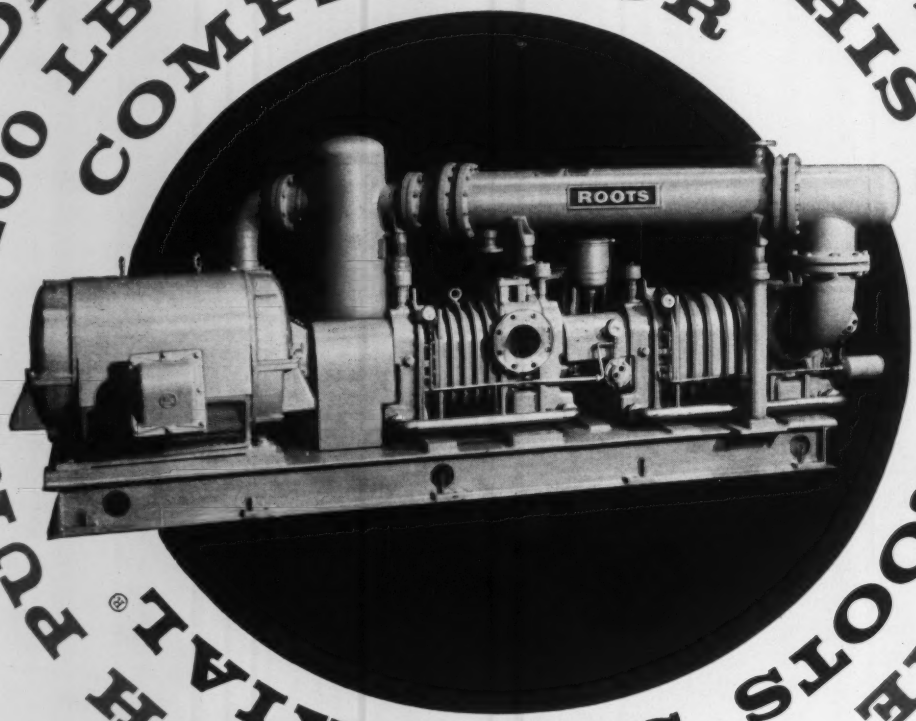
Coordination: "The purpose is to secure unity of effort. A system of communications with established 'centers of communication' is absolutely essential."

Authority: "This requires clean and clear lines from top to bottom. A position of authority is a post from which other positions expect to receive accurate communications."

Tolerable Span of Control: "The proper span of supervision rarely covers more than five or six people. Managing isn't the only job of a manager."

Other needs of organization: Responsibility, continuity, balance, and definition of duties of each position.

RIDE THE DOWNWARD SPIRAL IN PURITY 100 LB. AIR WITH THIS NEW ROOTS SPIRAXIAL® COMPRESSOR AND COST OF HIGH



The name is Roots C-100, and for you it means a two-stage *Spiraxial*® compressor that will now deliver oil-free air up to 100 psi. Even more important, this machine will bring down the real cost of compressed air in your operation by lowering equipment, installation and operation expense. Here's how:

LOW, LOW MAINTENANCE—The simple *Spiraxial*® design with intermeshing, screw type rotors provides effective axial flow compression without any mechanical contacts. There are no vanes, valves, rings or other wearing parts in the compression chamber to cause costly maintenance or downtime.

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HIGH EFFICIENCY—By using the principle of internal compression plus intercooling between stages, the C-100 achieves high efficiency. Through careful design, its performance curve shows peak efficiency when the compressor is operating at design discharge pressure.

SPACE SAVING COMPACTNESS—The C-100 is about half the size and weight of other units for the same service. Packaged piping and intercooler arrangement speeds up installation and lowers costs at the job site.

SMOOTH, STABLE PERFORMANCE—A simple, rotative machine, the C-100 operates practically without vibration and can be installed on a minimum, inexpensive foundation. Special Roots design assures stable, surge-free performance.

THOROUGHLY PROVED—The *Spiraxial* design has demonstrated its complete reliability over the years, in meeting stiff requirements of countless industrial and defense applications.

Developed for chemical processing, agitation, oxidation and other applications requiring 100 lb. air, Roots *Spiraxial* C-100 Compressors are available in seven sizes with capacities from 900 cfm to 3000 cfm. A companion line of *Single Stage* Spiraxial units is also available for lower discharge pressure requirements.

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COMMITTEE MEETING: In meetings of top management,* new products are speeded from idea to market.

How to Rush New Products From Drawing Board to Market

It takes a lot of thinking for a company to stay ahead of its competitors today.

Here's how one company uses "forced" thinking to speed new products to market at the rate of one per month.

By K. W. Bennett

■ More and more, a company's growth depends on developing new products ahead of the competition.

That industry is aware of this is evidenced by the $13 billion expected to be spent for research this year. Much of this will be spent by manufacturers in the search for new and better products to capture more and larger markets.

As the pressure to come up with new products has grown, so has the problem of getting the products from the idea stage to the market swiftly and smoothly. But it can be done.

One-a-Month — For example, Portable Electric Tool, Inc., Geneva, Ill., averages about one new product a month. It has paid off, too, for the company in the competitive, light-power tool field.

PET sales have risen from $257,000 in 1946 to $14.5 million last year. Employment has gone up from 50 employees to 850.

In practice, the PET system seems simple. Yet it can get a new product from idea to dealer in six months.

The system allows the company to introduce new products at a rate of one per month. It has put as many as four new products on the market in one month. But one item per month is optimum. Right now, 16 new products are in various stages of development.

PET system — Here's how it works:

New product planning centers around three basic committees. First in order is Planning; second is Product Evaluation; and the third is Product Control.

It's a vital part of PET's approach that all top-level management has immediate and continuous access to new products as they move from the idea stage to the end product.

Planning Sets Pace — Planning Committee is made up of president,

*From left to right: D. C. Baker, vice president-administration; R. E. Bigelow, executive vice president; J. L. Baker, president; R. K. Davis, vice president—research and development; and G. W. Weatherby, vice president—sales.

J. L. Baker, executive vice president R. E. Bigelow, vice president-purchasing G. W. Weatherby, vice president-research and development R. K. Davis, and vice president-planning W. B. Davis.

This committee is the pace-setter. It meets at least once a month. While it sets advance plans as much as four to five years ahead, it also handles jobs as specific as scheduling each stage in the life of a new-product idea — from preliminary drawings to manufactured product. It's headed by W. B. Davis, vice president-planning.

Evaluation and Control—Product Evaluation feeds detailed data to the top Planning Committee as it is needed. This committee is a three-man group. It's composed of the heads of production, engineering, and planning.

Product Control includes all members of the Planning Committee plus production and administration. As does Planning, it meets monthly. Its function: Blast roadblocks that might put a new product behind the development schedule established by Planning. The planning vice president also heads this committee.

Explains R&D vice president R. K. Davis: "Put simply, it's to keep everybody moving. Control's sole job is expediting."

Keep to Schedule—Planning and Control meetings follow an ironclad schedule. This has one purpose. It forces a busy executive crew to drop other jobs, sit elbow-to-elbow at least twice a month on new product ideas.

A second major point: New product planning centers around a vice president-planning. His jobs range from scouting new product ideas—whether from patent office literature or European listening posts—to heading the new product committees.

Davis to Davis—In practice, here's what happens:

Planning, under planner W. B. Davis, hands the new product idea to researcher R. K. Davis' engineers.

A three to five man team under a group leader does the "gut lay-out." This is a rough design for engineering department use. About two weeks is allowed in the planning committee's schedule for this job.

From this, engineering can estimate costs, juggle ideas for improving the product. With a 12-man engineering pool, plus 26 supporting personnel, PET maintains three of these product groups. Each may be handling three or four assignments. In addition, a floating reserve of six engineers can be thrown in if the going proves rough.

Layout Schedule—At this point, the schedule is elastic. Engineering may spend two-to-nine weeks mulling over its gut lay-out. This is a period of study and redesign. The gut lay-out is followed by the final lay-out. Says a PET engineer, "This one is for real." It represents the best design job engineering can do without testing. Two-to-four weeks is allowed for final layout.

The final lay-out is cleared for detailing. Parts of the plan are distributed among all the engineering project groups for detailed drawings and re-study.

Paper to Testing — The new product is five to nine weeks old. It exists on paper. Now, first prototype models are built. From this come pin point data on castings costs, machining costs. Planning's original program has allowed four to five weeks for modeling. Along with engineering, the planning vice president reviews costs.

Now nine to 14 weeks of age, the model is ready for lab and field testing. Testing, again, is elastic, but can be completed in five weeks or less.

"Pink" (Not for Production) blueprints are issued. Though all departments are abreast of the new product's progress through regular or special control committee meetings, the "pink" blueprint is aimed to put all departments on their toes.

SIMPLIFY ASSEMBLY: By concentrating on standardized components, PET engineers simplify both manufacturing and assembly operations.

It constitutes a "dry run" of the manufacturing procedure before actual manufacture begins.

Forcible Reminder—Purchasing, production, and sales departments receive a "pink" blueprint. They review what's needed, are forcibly reminded of the machine scheduling that's necessary. At the same time, any of these groups can offer last minute ideas for design improvement. Purchasing checks suppliers, production reviews machine schedules, sales checks its promotion activities.

Final Form — The product is cleared for release. Though it's now moving into actual production, it's not out of the woods. A production liason engineer follows it through manufacture, to see that purchased parts conform to original drawings. He follows it right through to final packaging. He works independently of quality control.

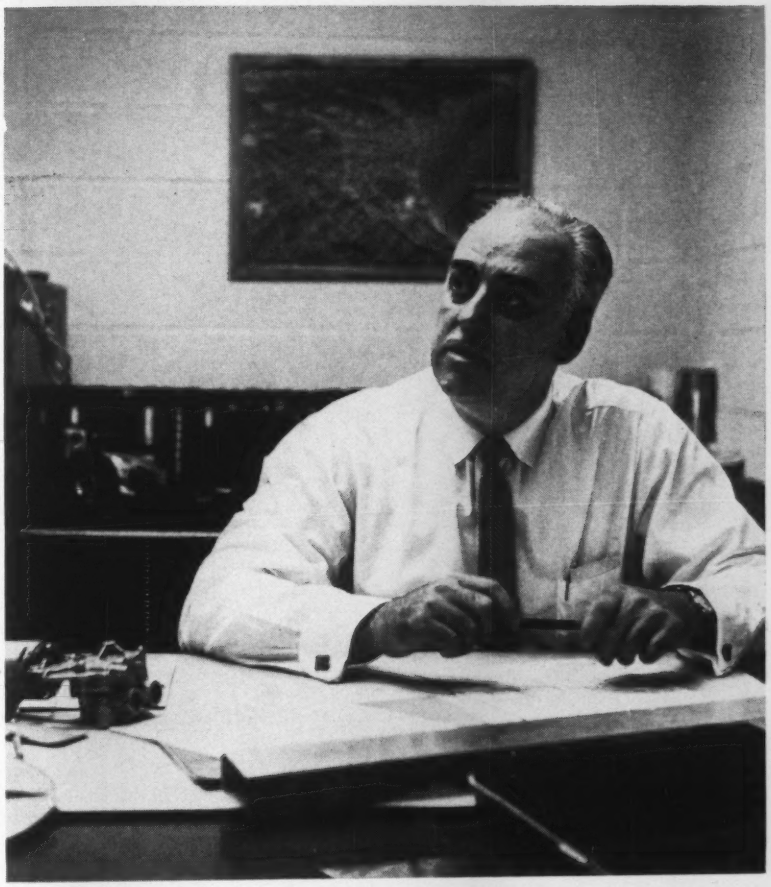
A sales engineer takes over. He reviews customer and distributor comment over a six month period.

The PET system depends on three basic points.

Simplicity—Only two pieces of paper keep all top level personnel on top of product progress all the way to manufacture: The planning schedule, which came from the Planning Committee as the new product was released to engineering; and the Project Specification Sheet. From the same source, it covers the product's specs, expected sales, costs, probable competition.

Continuing Survey — Through Control Committee meetings, and through daily contact with the vice president planning or vice president engineering, everybody knows the new product's progress.

System—The project is charted, timewise, from the time its selected as an addition to the company product line. Everybody, whether in purchasing or production or sales, knows what the product is, what it requires from his department, when it is needed.



MAN WITH THE PLAN: Planning vice president W. B. Davis heads key committees which speed products through all stages of development.

PET Lessons—Some PET comments on what has been learned:

It's better to shove back on an existing product than to delay in getting to work on a new product that looks "hot."

Where possible, new product introductions should be staggered to avoid a glut of new products introduced in a single month, to meet "seasonal" sales factors.

Most bottlenecks occur in the tooling stage, when a great deal of time and money are already tied up in the new product. These can be eased with the "pink" blueprint system.

New products are the lifeblood of any expansion program. A growing company cash income should mean growing expenditures for new product development; equal to, or exceeding, annual depreciation.

Money Well Spent—PET admits it studied new development programs in many companies in evolving its own. And Planning vice president W. B. Davis points out that the program is far from static.

The committee system has worked so well, the company is now forming a "design improvement" committee. It will study possible advances in design on existing products. This will bring the number of product design committee meetings for top PET personnel to three per month.

The committee approach puts a lot of executives in a single room for a considerable amount of time per month. PET, with a sales gross that's multiplied 56 times in the past 15 years, figures it's money well spent.

Gown by
Fon Tayne
reflected in
stainless by
Crucible
Steel
Company
of America

Stainless by

CRUCIBLE

where a fine finish is only the beginning

Ford Switches Assembly Lines

Mercury Goes to St. Louis; Wayne Will Get Fords

Ford Motor Co. is shifting the St. Louis assembly plant from Ford to Mercury production in the fall.

Another change due soon: Wayne, Mich. will be building Fords along with Mercurys. By A. E. Fleming.

■ The decision of Ford Motor Co. to shift its St. Louis assembly plant to Mercury from Ford production this fall is being matched by another rearrangement of sorts.

For the first time, Fords will be built at Wayne, Mich., which in the past few years has catered exclusively to Mercury.

The St. Louis shuffle was announced by the company. Wayne's was not. But it should come shortly.

Double Line—Soon to come off Wayne's assembly line are Ford Galaxies and five models of Ford station wagons. They will join Mercury Montereys and two Mercury wagons.

Galaxies and Montereys share the same basic body. This lends simplicity to dualing the pair.

Along with others, Mercury has been weathering sales storms in the medium-price field. The middle range of the market is shriveling as compacts rise in prominence. Introduction of the compact Comet in early 1960 and the low-priced Meteor (including the first six-cylinder engine in Mercury history) a year ago were steps leading into the healthier low price bracket.

New Meteor—This fall Mercury exhibits a new Meteor. It will be a bit larger than the Comet. And it will share the body of the new Ford Fairlane.

Mercury will do some tampering with names when the 1962 models arrive. Comet will officially become Mercury Comet.

Same Name Game

Studebaker is running into name trouble again.

Last spring Buick unwrapped a luxury version of the compact Special calling it the Skylark. Studebaker was peeved at the resemblance to the Lark label.

The South Bend manufacturer will introduce a Gran Turismo Hawk in September. At the same time, Dodge will show off a new bucket-seat Lancer called the Gran Turismo.

Daimler-Benz Unveils Mercedes Models

NEW FOR '62: Daimler-Benz A. G. has unveiled its new Mercedes-Benz models. The completely new luxury model 300SE (top) has a new, light-alloy fuel-injection engine, automatic four-speed transmission and unique air suspension system. The new, more powerful, roomier version of the Mercedes-Benz 190 and 190D (diesel) series (bottom) has a longer wheelbase, greater overall length and special engineering features.

Alaska: Frozen Giant Awakes

New Sources of Vital Minerals Attract Industry

Some 31 of the nation's 33 critical minerals can be found in quantity in Alaska.

Outside investment in the state is growing with the lure of huge potential in undeveloped natural resources.

By R. R. Kay

■ Alaska is awakening—and flexing its economic muscles. There are signs of growth and sound reasons for optimism.

Huge potential still lies in undeveloped natural resources. Some 31 of the nation's ~~33~~ critical minerals are in Alaska.

But Gov. William A. Egan calls for caution. It's a tough job, he points out, to bring up a state by its bootstraps after years of Federal operation.

Answers Need—Governor Egan says, "Despite Alaska's growth, the state remains the most undeveloped, as well as underdeveloped, area under the U. S. Flag. As such, it represents the answer to industry's search for new sources of supply to meet the increasing need for more and new products. It also represents, in increasing degree, a new market for industry."

There's evidence that industry recognizes Alaska's potential. Outside risk capital and investment funds are coming in slowly. But little by little, they are getting larger, the Governor reports.

Japanese Interest—Japanese capital is building a $66 million pulp mill. Japanese industrialists are also looking into more timber stands, iron ore, and other resources for which they are hard-pressed.

A Japanese market for Alaskan coal is "very likely."

Two companies have announced plans to build a cement-making works near Anchorage.

New Pipeline—The state's oil and gas industry is expanding rapidly.

There are now 27 producing wells and a 10,000-barrel-a-day pipeline. Oil explorations range from $30 to $35 million per year. This year alone will see nearly 50 new wells.

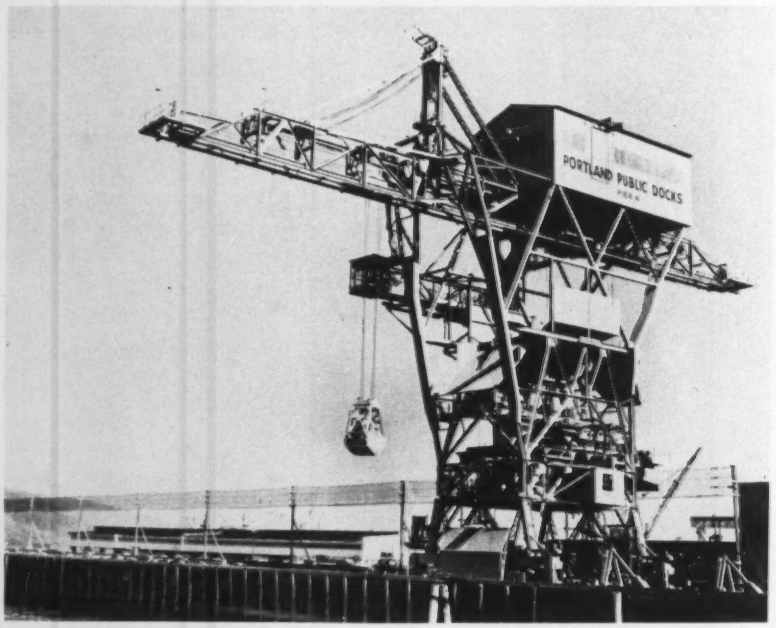
Geologists feel as much as a third to a half of Alaska is "structurally favorable" for oil.

Shipping Solved—Recently, four railroads joined to announce a new seatrain barge service between Seattle and the 49th State. This should help solve a big problem in the Far North: The need for faster transportation of heavy goods.

Two U. S. government projects could have major importance: 1. Use of an atomic bomb to create a new harbor; this could be underway by the spring of 1963; and, 2. Release by the Army of the Port of Whittier, for possible use as an industrial base.

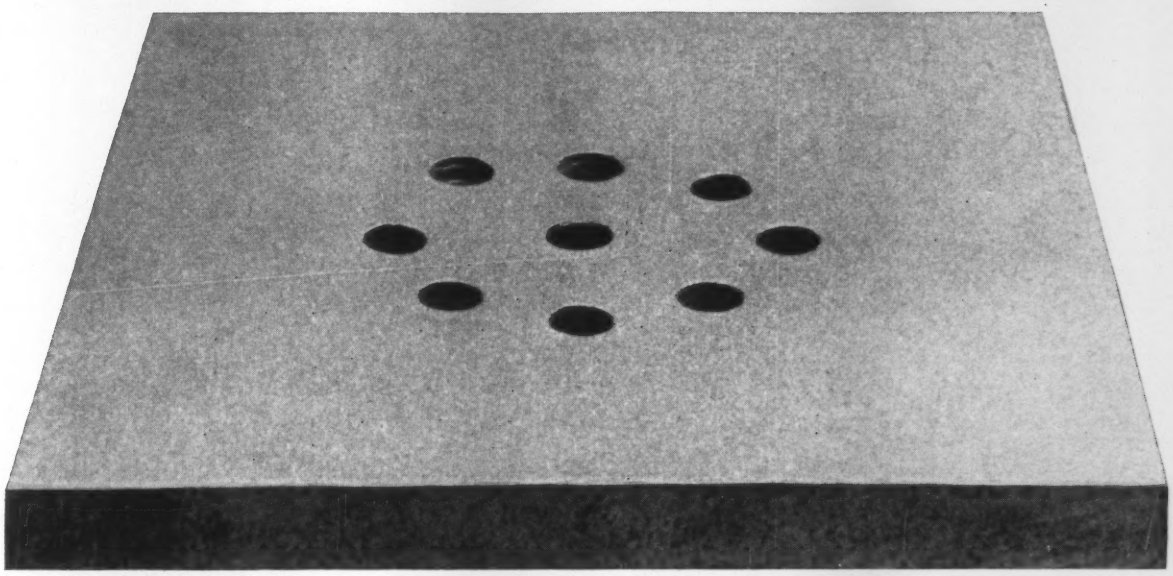
Successful development of controlled nuclear earth-moving methods would have an enormous effect on the construction industry.

Traveling Tower Speeds Ore Unloading



STREAMLINED PORT: A 900-ton-per-hour traveling bulk unloading tower will handle imported ores from deep-draft vessels and barges at Portland, Ore. It was built by Dravo Corp. as the final step in the Portland Commission of Public Dock's $6.5 million modernization program.

BLAST!

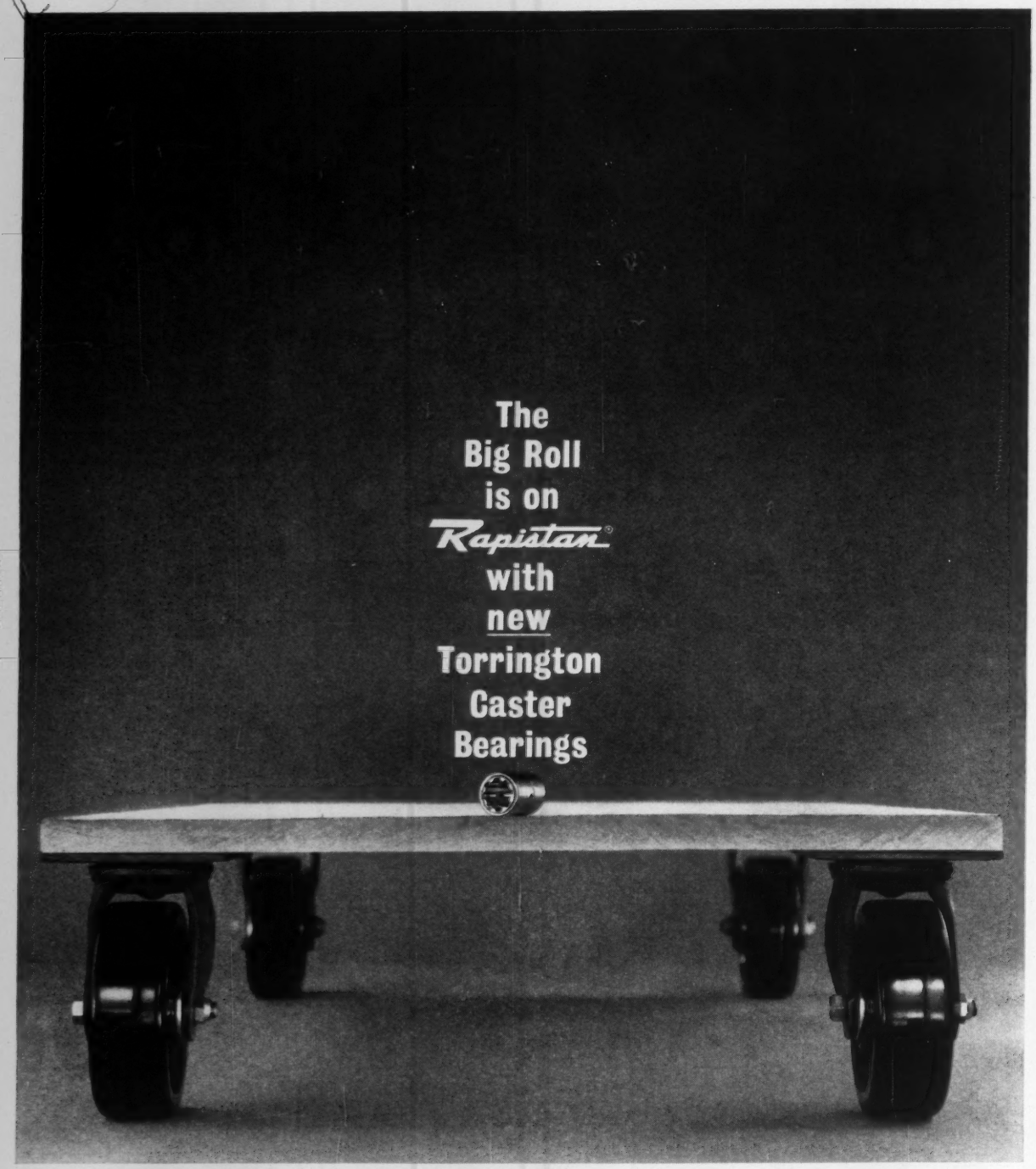


Remove burrs faster at lower cost...with Blastite® Ever think of removing burrs by pressure blasting with sharp abrasive grain? It's worth investigating . . . this steel plate was deburred with Carborundum Blastite No. 100 in just a few seconds with standard equipment. And note: none of the burrs were merely turned over—every hole is clean-as-a-whistle. A radius has been added and the surface cleaned.

Pressure blasting may prove to be *your* most efficient method—not only for many deburring jobs—but also for removing surface deposits, finishing hard-to-reach areas, stress relieving and forming decorative finishes. You can quickly investigate the benefits of pressure blasting for any finishing operation—simply call your Carborundum distributor or district office. A fully equipped abrasive finishing methods laboratory and sample processing facility is at your service.

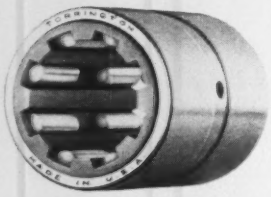
CARBORUNDUM

Electro Minerals Division, Niagara Falls, New York



Improved rollability, greater load capacity and a three to four times increase in service life are the outstanding advantages offered by new Torrington Caster Bearings used in the famous Rapids-Standard line of casters and wheels.

The Torrington Caster Bearing is a true precision bearing consisting of double paths of rollers retained in a drawn cup outer race. A molded plastic retainer effectively spaces rollers . . . insures true rolling even in tough shock load or high speed drag line applications. Ample provision for lubricant retention. Friction at a minimum. Simple press fit makes handling easier and faster . . . substantially cuts assembly time and costs.



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Broaching Tackles New Jobs

New Tool Design Concepts Expand Broaching Role

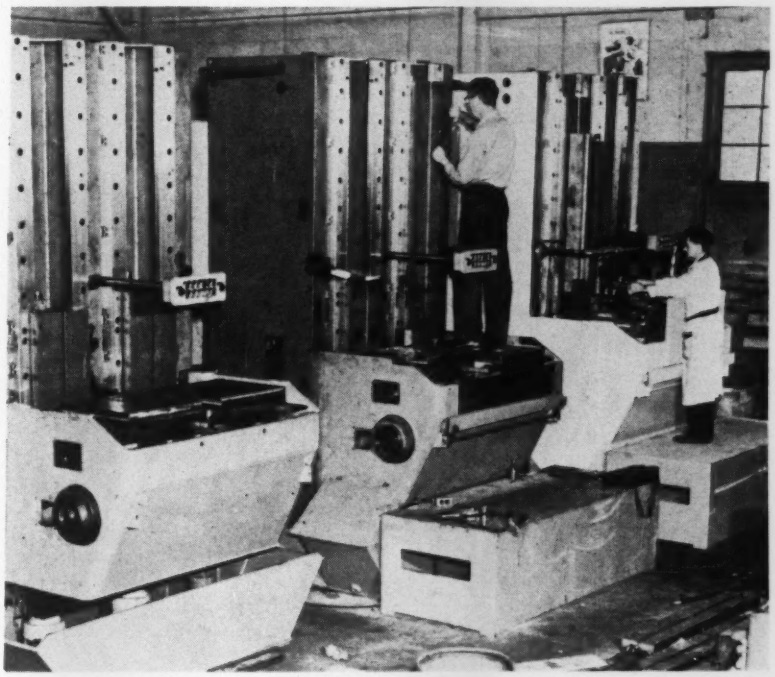
Often regarded as a high production process, broaching is now showing versatility.

One horizontal-position broach precision finishes 5-ft I-beams of uncommon alloy; another does two jobs at once. By R. H. Eshelman

■ Broaching is often regarded as a high production process. But some new developments show that it is a more versatile process than many realize.

In one recent case, a leading machine builder solved a precision production problem for a company in the atomic energy field.

The parts involved were long, thin I-beam parts of an uncommon alloy. Some of these pieces—parts over five ft in length—used excessive machine time in traverse. By developing new tool design concepts, the broach maker was able to come up with a solution.



BROACH BUILDING: Dual-ram broaching machines are assembled before shipment to auto maker for use in broaching front wheel spindles. Units such as these are helping solve precision production problems.

Part Moves—The broach is designed to operate in a horizontal position. The main slide of the machine is arranged to operate in this position to allow use of the special work-clamping fixtures mounted on the slide. These are arranged with multiple, self-equalizing hydraulic clamping units that hold the zirconium alloy beams rigid while moving them past the stationary cutting tool.

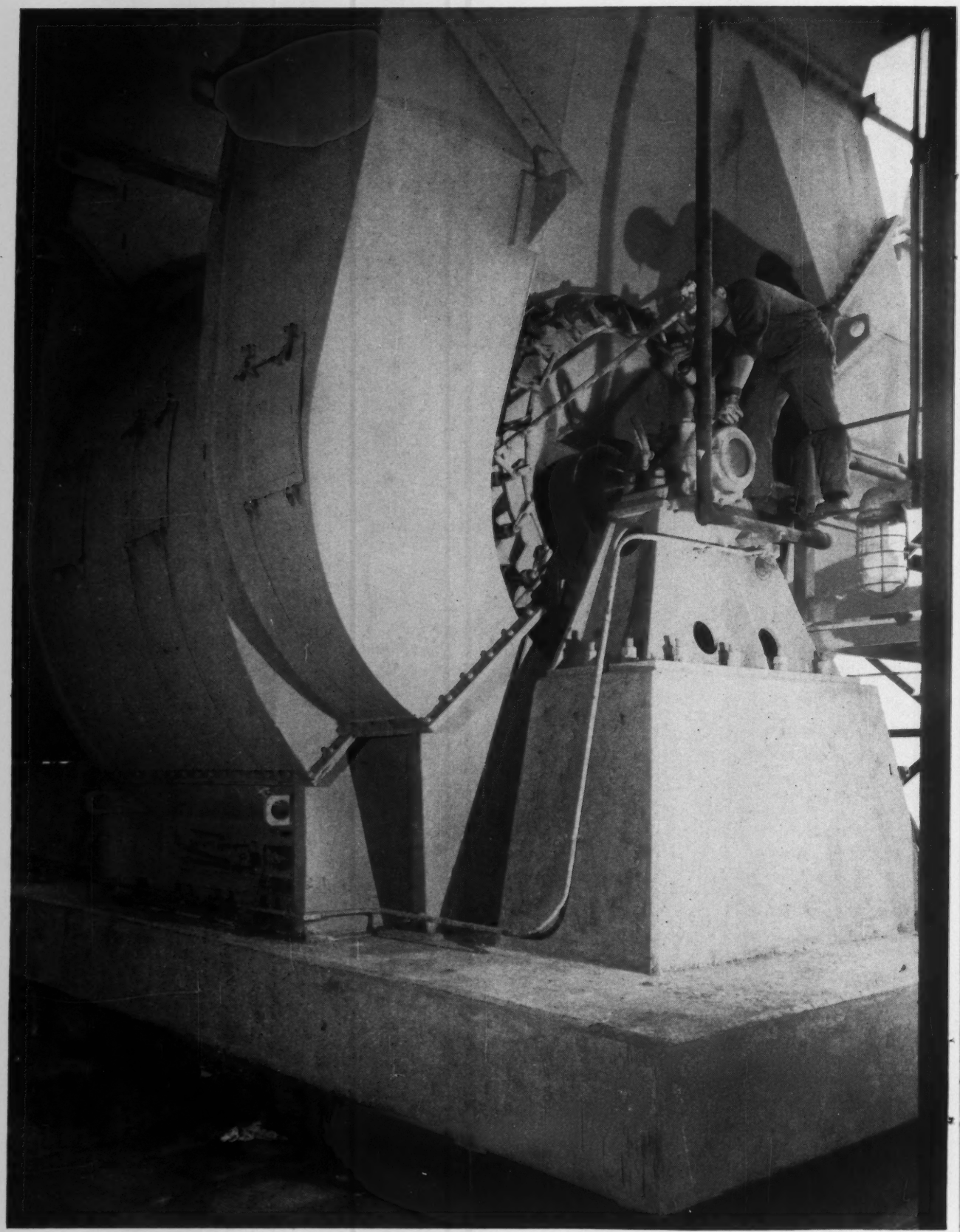
Cutters are a combination of generating and slabbing type tools that straddle the part while making five progressive cuts. Teeth are carbide tipped.

The new setup now produces the finish form desired on two sides at the same time. Also, flatness and parallelism are held within a couple thousandths.

Dual Operations—Another trend to give broaching more versatility is to combine in one machine two different types of operations. In a setup for a major appliance maker, Detroit Broach & Machine Co., Rochester, Mich., reports that this resulted in direct labor costs of 50 pct. Overhead costs were reduced almost as much. And a savings in floor space of about 30 pct was made.

The combination of operations is internal broaching and surface broaching. The arrangement works for one part requiring both processes or can be used for two separate parts of sub-assemblies. According to E. H. H. Graf, company vice president, the big idea is "usable for combining operations in a single machine where you would need two machine units otherwise."

High Output—Rough and finish broaching a keyway in a steel refrigerator compressor is combined with removing three locating lugs from the part circumference with slabbing broaches. On this job, the new machine handles 188 pieces per hour at 70 pct efficiency. Key to the development is use of dual shuttle tables.



RD Fan used for induced draft on basic oxygen furnace of large steel producer. There are four identical units, each producing 325,000 cfm against a static pressure of 15" wg at 550° F.

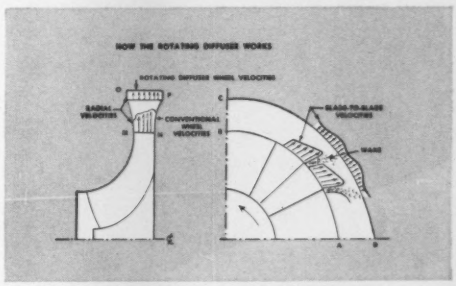
JOY RD FANS CAN PROVIDE PRESSURES UP TO 4.5 PSI AND CAPACITIES UP TO 600,000 CFM

Joy RD Centrifugal Fans, based on a new concept in fan design, can provide any volume of air or gas at pressures up to 4.5 psi in a single stage. This means important savings in initial cost. An equally important saving is their high efficiency over a wide range of volume, which is especially important where load fluctuates. Surging, even on parallel operation, is no problem because the RD Fan is inherently resistant to pressure surge over its entire duty range.

These advantages of the RD Fan are the results of its unique rotating diffuser. Instead of stationary diffusers, the RD diffuser is an integral part of the wheel—added at the blade tips. The rotating diffuser reduces the gas velocity before leaving the wheel and up to 98% of the conversion of velocity to pressure is accomplished with the wheel of the RD Fan.

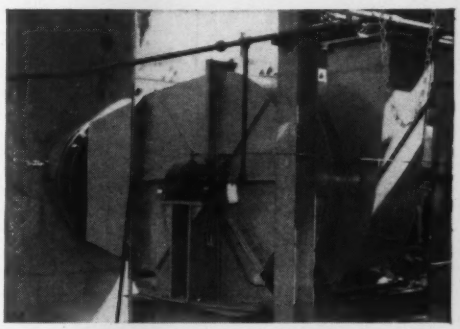
Radial blades in the RD Fan tend to be self cleaning, even when handling dust laden and dirty gases. The rotating diffuser results in low noise levels because of the lower and more regular velocities leaving the wheel and because the blade tips are remote from the cut-off.

The Joy RD Fan is finding steady acceptance in induced draft and forced draft applications in the steel and power industries, in handling chemical process gases, and in heavy duty industrial applications. For extremely dirty or corrosive applications the entire unit may be fabricated of stainless steel. Parts are simple because there are no large castings or close running tolerances. For complete information and duty areas of the RD Fan, write for bulletin 3449-48.



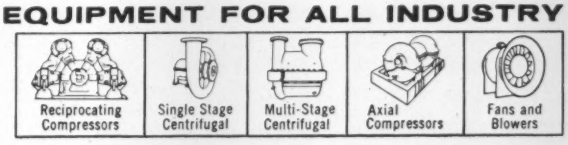
HOW THE ROTATING DIFFUSER WORKS

Studies have shown that radial velocities leaving conventional wheels are unequally distributed, as shown in MN. Also there is fluctuation in the blade-to-blade velocities based on $\frac{nN}{60}$ where n is the number of blades and N is the speed in rpm. The Rotating Diffuser reduces the gas velocity before leaving the wheel, which allows more uniform flow as shown at OP and CD. Without the rotating diffuser, velocities are much higher and erratic as shown at AB and MN, causing turbulence, friction losses.



Joy RD Fan at eastern CO_2 plant. Unit has capacity of 27,800 cfm, at 3 psi. Drive is a 450 hp steam turbine.

AIR MOVING EQUIPMENT FOR ALL INDUSTRY



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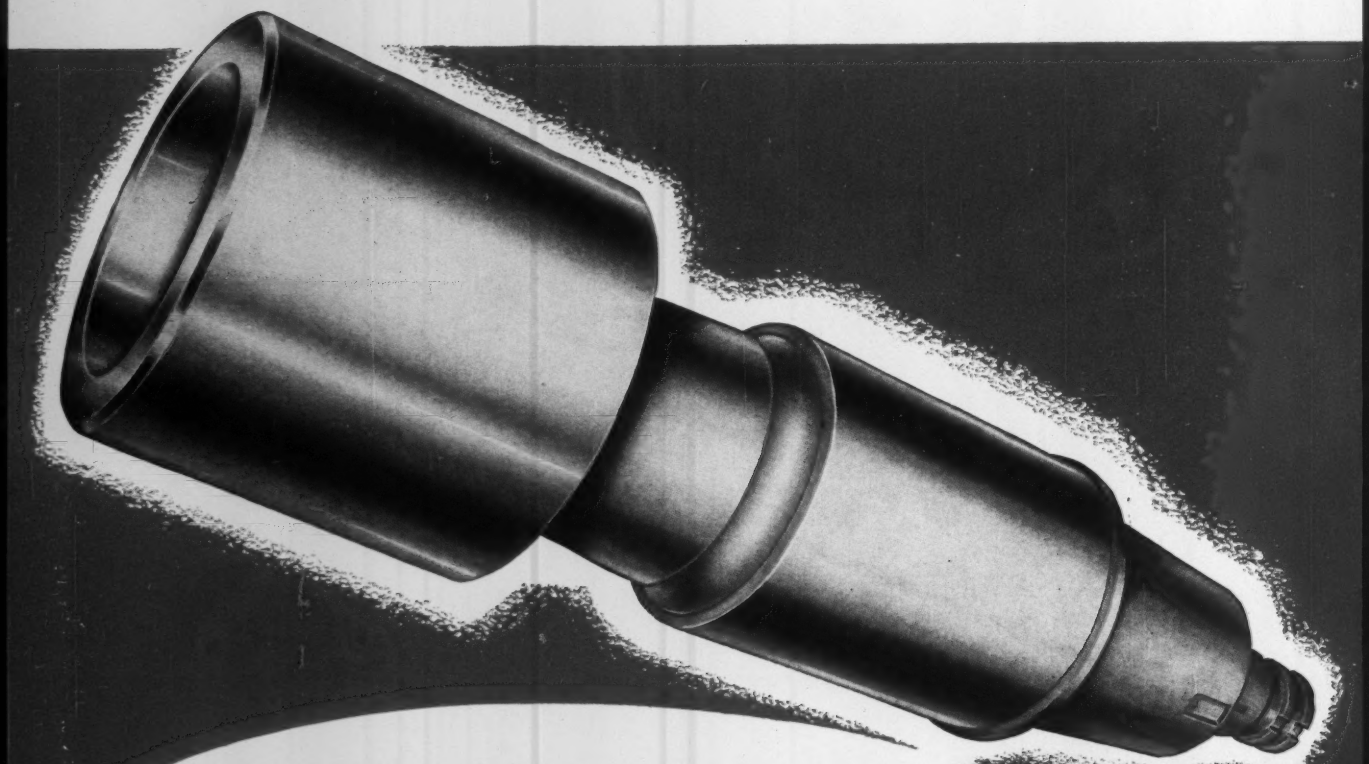

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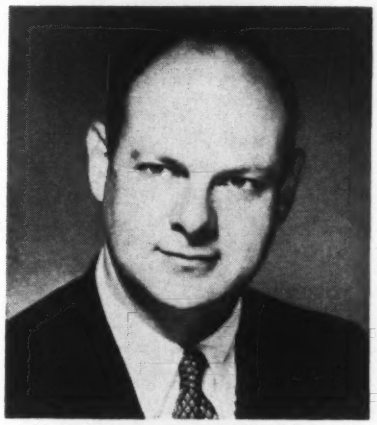


B. V. Brooks, Jr., elected vice president, finance, Murray Corp. of America.

Westinghouse Electric Corp.—R. J. Douglass, elected president, Westinghouse Electric International, S. A. (WEISA), Geneva.

Datatrol Corp.—J. E. O'Hara, Jr., appointed vice president.

General Bronze Corp.—E. F. Jeffe, elected president and a director.

General Time Corp.—D. P. Caverly, elected vice president.

Dalmo Victor Co.—W. F. Gates, appointed vice president, products.

Mallory Metallurgical Co.—H. J. Fillenwarth, Jr., named controller.

National Lead Co.—A. F. Bauer, appointed manager, Doehler-Jarvis Div.

Portable Electric Tools, Inc.—M. A. Hult, elected treasurer.

Amertool Services, Inc.—H. A. Finch, elected president; J. A. Gerard, elected vice president.

Aluminum Co. of America—DuBose Avery, named vice president, commercial, and R. P. Goodwin, elected vice president, Alcoa International, Inc. and managing director, Alcoa International (UK) Ltd.

Kaiser Aluminum & Chemical Corp.—B. N. Wilson, appointed sales manager, Far East, Kaiser Aluminum International.

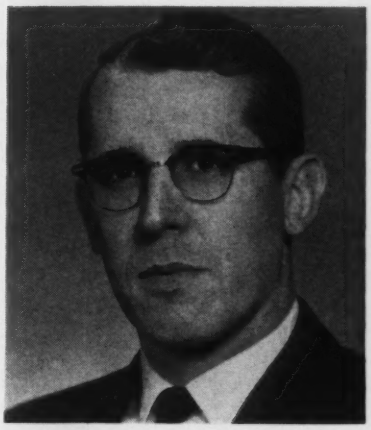
Bloom Engineering Co.—J. M. Simpson, elected to the board of directors and secretary; J. F. Walsh, elected to the board and treasurer; F. S. Bloom, elected to the board.

Indiana Forge & Machine Co.—E. J. Carlson, elected chairman of the board; E. J. Carlson, Jr., elected president.

McLouth Steel Corp. — James Ambrose, appointed general superintendent, Detroit plant.

National Beryllia Corp.—R. L. Hurley, appointed vice president, marketing.

Ekco-Alcoa Containers Inc. — Louis Schuum, named general manager and R. H. Tooker, named sales manager, Unit Container Div.



J. D. Barton, appointed vice president, industrial relations, Great Lakes Steel Corp.

Chrysler Corp.—W. S. Venn, named vice president, Chrysler Motors Div.

General Motors Corp.—Dr. A. T. Nordsieck, appointed to head Technical Specialties Dept., Defense Systems Div.

Studebaker-Packard Corp. — R. E. White, named federal procurement coordinator.

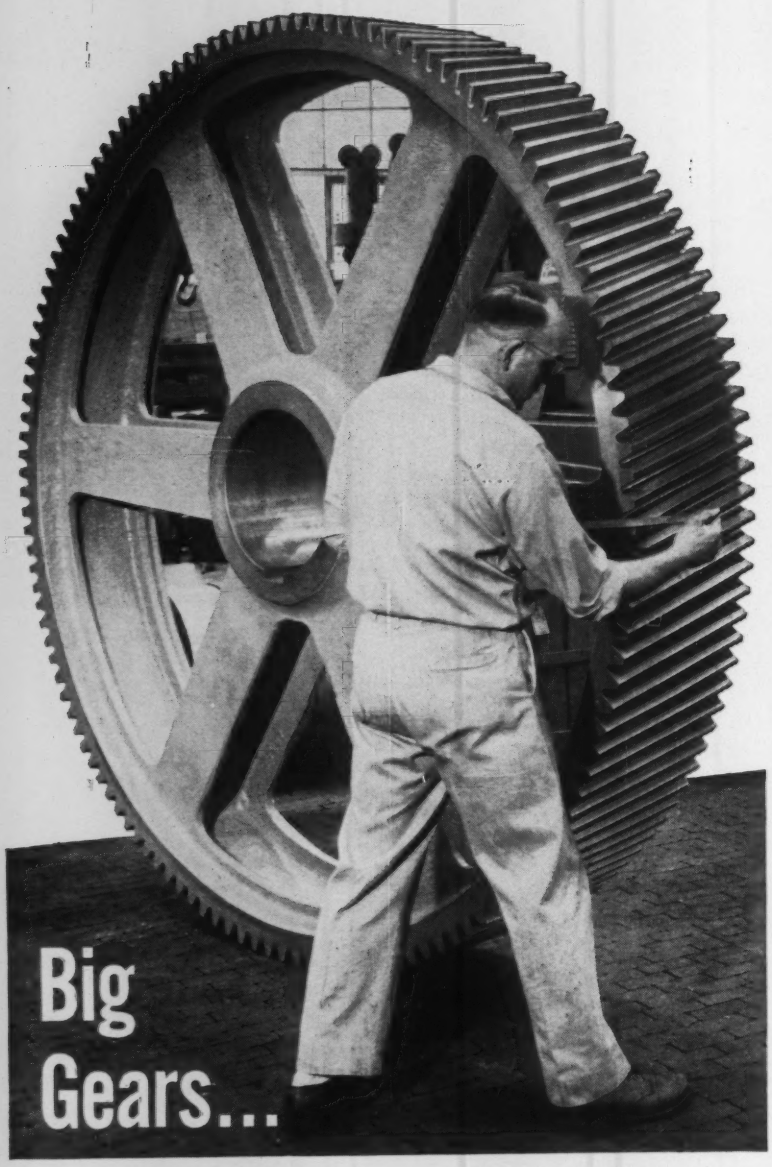
Rockbestos Wire & Cable Co.—J. H. Fuchs, appointed executive asst. to the president.

(Continued on P. 56)

J. D. Flaherty, named secretary-treasurer, Swindell Dressler Corp.

C. C. Dybvig, appointed vice president, marketing, Dana Corp.

J. R. Strom, named vice president, Roto-Finish Co.



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(Continued from P. 55)

General Electric Co.—A. J. Gizzi, appointed manager, manufacturing and engineering.

Borg-Warner Corp.—S. B. Kurzina, Jr., appointed works manager, Borg & Beck Div.; M. B. Millenson, appointed manager, economic research.

Carpenter Steel Co.—W. K. Kise, Jr., named manager, electronic alloy sales.

Roto-Finish Co.—R. D. Taylor, appointed marketing manager.

Inland Steel Co.—G. M. Burrier, appointed asst. general manager—primary production, Indiana Harbor Works; W. E. Geidt, named manager, marketing, Inland Steel Container Co.

Chicago Pneumatic Tool Co.—R. B. Miller, appointed general sales manager.

Gleason Works—B. J. Mezger, appointed manager, technical coordination.

Reynolds Metals Co. — H. A. Ong, named divisional sales manager, architectural and building products.

Republic Steel Corp. — D. E. Poole, appointed chief engineer, southern district.

Leeds & Northrup Co.—K. S. Stauffer, named manager, accounting div., instrument and controls financial dept.

Joseph Behr & Sons, Inc.—Frank Richter, appointed account executive.

Industrial Tectonics, Inc. — Karl Giesler, appointed asst. sales manager, special products.

Mohawk Tools, Inc.—L. J. Limone, named district sales manager.

National Steel Corp.—A. D. Peirce, named sales manager, West Coast; J. H. Jacobs, Jr., appointed asst. district sales manager, Detroit; E. J. Udick, appointed resident manager, Los Angeles.

Jessop Steel of California—C. D. Hoffman, named general manager, sales.

J. B. Fisher, named general manager, sales, Superior Steel Div., Copperweld Steel Co.

Industrial Technological Associates, Inc.—C. P. Hawkins, named director, management consulting.

Loftus Engineering Corp.—W. C. Shirley, appointed staff consultant, Non-Ferrous Div.

Norma-Hoffmann Bearings Corp.—E. O. Orth, appointed midwest regional sales manager; R. P. Ryndress, appointed central regional sales manager.

American Potash & Chemical Corp.—H. L. Carroll, appointed Atlanta, Ga., district sales manager.

Allied Chemical Corp. — J. M. Blalock, appointed manager, heavy chemical sales, General Chemical Div.

Syntron Co.—W. E. McNanny, named sales product engineer, Semiconductor Div.

Reflectal Corp.—G. L. Smith, appointed general sales manager.

Minnesota Mining & Manufacturing Co.—R. N. Wolfe, named general manager, adhesives, Coatings & Sealers div.

OBITUARIES

A. J. Fisher, Jr., 47, executive vice president, Metal & Thermit Corp.

W. K. Sproule, 48, consulting metallurgist, Development and Research Div., International Nickel Co., Inc.

Acme Industries, Inc. — R. E. Brant, appointed manager, special heat exchanger products.

Towmotor Corp.—R. D. Jones, appointed asst. sales manager.

Owatonna Tool Co.—T. F. Devine, appointed district manager, Southern Ohio, Eastern Kentucky and Southwest Virginia.

Granco Steel Products Co.—R. L. Skaggs, named manager, form and metal roof desk sales.

Harbison-Walker Refractories Co.—L. M. Allen, named district sales manager, Charlotte, N.C.

Lodge & Shipley Co.—J. E. Bashforth, appointed field sales engineer.

Oakite Products, Inc. — R. P. Jones, appointed to headquarters staff.

Wheeling Steel Corp. — V. C. Dollman, named manager, tubular sales dept., effective Sept. 1.

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This process of diffusing one or more elements into the surface of steels, superalloys, or refractory metals protects them from oxidation and thermal shock failures at high temperatures. The integral alloy case won't peel or flake off, and the diffusion alloy is easily formed on internal surfaces.

Base Metals	Operating Temperature	Applications
Steels	1500°F	Heater casings, radiants, Soldering irons cores
Stainless Steel	1800°F	Jet engine control rods
Superalloys	2100°F	Jet engine turbine vanes and blades
Molybdenum	3400°F	Space vehicle components, thermocouple tubes

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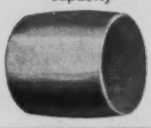

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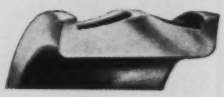

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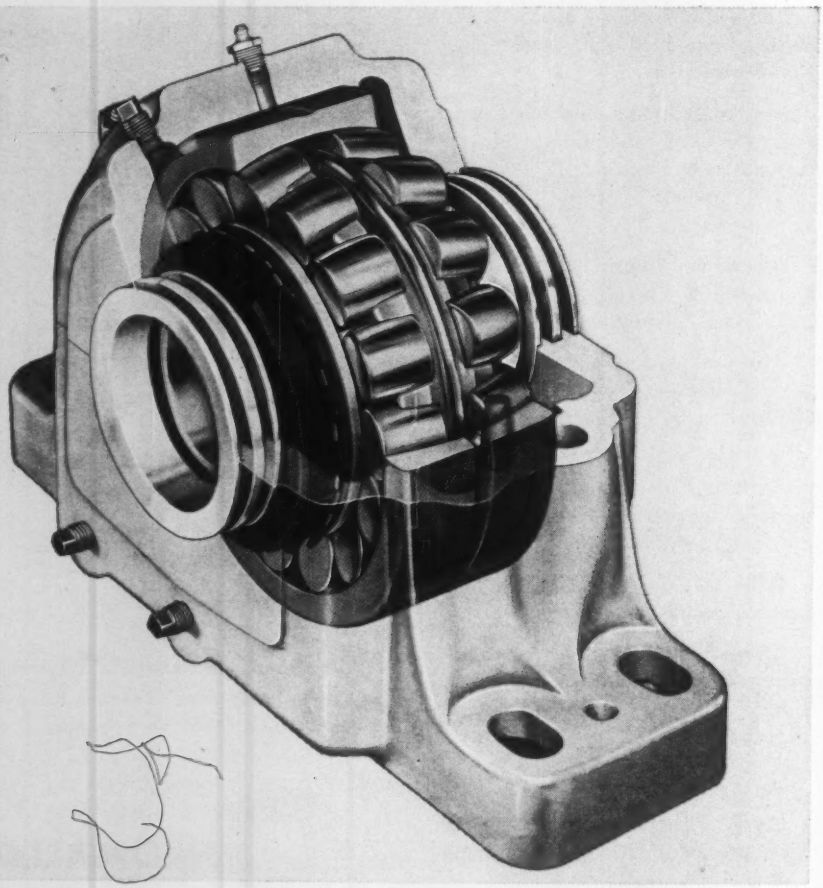
For full details, call your nearest Link-Belt office or authorized stock-carrying distributor. Look under BEARINGS in the yellow pages of your telephone directory. Ask for Book 2760.



SERIES 6800, 6900, 7800, 7900 have exceptionally rugged, two piece housings—machined as two perfectly matched parts providing easy installation.

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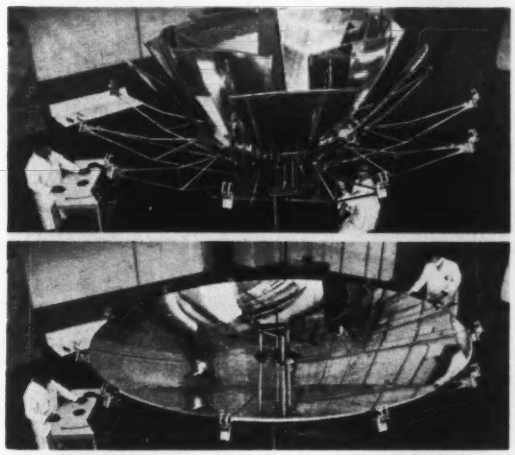
Atomic Dip Stick

Measuring propellant in missile and rocket fuel tanks is simplified by a new nuclear gage. Using radioactive isotopes and detectors mounted outside the fuel tanks, it measures fuel levels within 2 pct. Gamma rays from the gage pass through the tanks. The ray's intensity is then read by detectors to indicate the amount of fuel.

A Space Flower Blooms

Like a flower, equipment for GE's new Solar Test Facility has petals that open. In full bloom



FOLDING MIRROR: Heart of a solar-power

it becomes a parabolic mirror for concentrating solar energy or heat. The 16-ft diam aluminum-coated mirror folds for compactness during travel through the atmosphere.

Scientists Favor Speedup

The professional astronautics community believes there is more at stake in the international space race than national prestige. A series of polls, taken among the nation's top space organizations, proves that our researchers overwhelmingly favor a speedup in order to win a competitive edge for the U.S. in space exploitation.

Dial Around the World

Even before the first U.S. satellite communication really gets under way, research has begun on new ideas. NASA plans a new system using smaller satellites at high altitudes—over 20,000 miles in space for world-wide talkies. Known as project Syncom, it's a big step upward from Relay which uses bigger satellites only 3000 miles from earth. Another idea calls for orbiting a 24-mile wide band of wire particles into space.

Hot Meals for Space Men

Future astronauts may be served hot meals by courtesy of the sun via a food warmer powered with solar energy. This solar stove, developed by the Air Force for use in space vehicles, uses a magnesium plate to collect solar fuel. The unit contains three food containers, each with separate temperature controls. Operating temperatures range between 70° and 162°F.

Safer Wheels for B-58

A shatter-proof wheel for the B-58 supersonic bomber has been developed by The Goodyear Tire and Rubber Co. A 1-in. solid-aluminum belt encircles the center flange and protects the wheel against shattering. In case of tire failure, the plane continues its takeoff roll on the forged aluminum, thus holding the weight off the outer rims. Tests were conducted by firing spikes into the wheels while the plane powered down a 1500-ft runway.

NBS Studies Sun Spots

Without warning of impending solar flares, space flights face the possibility of running into deadly geomagnetic storms. Steps are now being taken by the National Bureau of Standards to safeguard space travelers. Sensitive instruments there recently picked up a sun disturbance. From it, they were able to forecast a storm two days in advance. Within an hour, warnings are out.

Photoelastics at 500°F

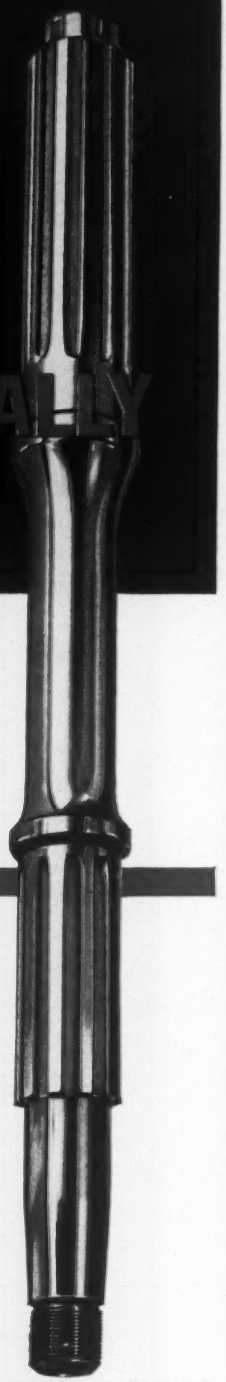
Scientific tests to develop a photoelastic coating capable of withstanding temperatures in excess of 500°F are under way at Chance Vought Corp. Because of high space-flight temperatures, such problems as creep, strength reduction and variations in thermal expansion of exotic structurals are little understood. Once coatings are perfected for high temperature use, more efficient designs will be realized.

Rockwell-Standard
changes from hot-rolled A-4140 to

fatigue-proof®
STEEL BARS

elevated temperature drawing process **e.t.d.**

INCREASES PRODUCTION SUBSTANTIALLY — doubles tool life



Increases turning production 20%

Increases drill life 50%

Eliminates heat treating

Here's an example of how a small additional investment in material enabled Rockwell-Standard to increase production and cut cost on an axle for farm equipment.

Part: Axle for a self-propelled harvester.

Steel: FATIGUE-PROOF steel bars . . . replacing HR resulphurized A-4140.

Result: Heat treating eliminated. More uniform hardness across the section (302 Brinell) including small diameters. Hand straightening eliminated. Shaft runout in turning, reduced from an average of .015" to .005" in turning. Lower cost per part.

PRODUCTION INCREASES

Turning Operations: Speed increased approximately 45%. Tool life increased from 12 to 25 pieces per tip . . . tungsten carbide tips were used.

Drilling Operations: Drill life increased approximately 50% with FATIGUE-PROOF.

Milling Keyway: Entire lot of 550 pieces were run on one cutter . . . cutter formerly required sharpening after 300 pieces.

Hobbing Operations: Production increased approximately 60% . . . from 26 pieces per hour to 44.2 pieces per hour. Hob life doubled.

FATIGUE-PROOF steel bars offer all these cost cutting advantages.

No heat treating necessary—no quench cracks, warpage or other heat treating problems. Costly operations eliminated.

Exceptional Uniformity—from surface to center, end to end, bar to bar, size to size, and lot to lot.

Faster Machining—faster than annealed alloys; 50% to 100% faster than heat treated alloys.

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Cryogenic Forming: New Process Stretches and Strengthens

Fabricators are learning to take advantage of ultracold temperatures.

A new forming process uses liquid nitrogen to simultaneously form and strengthen stainless steel.

■ Forming while submerged in liquid nitrogen . . . this is the key to a new metalworking process which provides both process economies and improved properties when forming stainless steel.

Called Ardeform, the process was developed for making rocket cases. However, it's expected to find use in making thin-walled pressure vessels, mobile cryogenic storage containers, and high-strength tubing.

"Market studies, only now getting under way, are expected to disclose additional applications for the new process in both commercial and defense areas," says Harmon Hugo, president of Arde-Portland, Inc., developer of the process.

AFTER FORMING: Worker removes vessel from forming tank after cryogenic stretching. Vessel is still at liquid-nitrogen temperature (–320°F).

No Size Limits—The Paramus, N. J. company has fabricated spheres up to 16 in. diam and cylinders up to 4 ft in length by 12½ in. diam. It's claimed that there are no limits to the size of the product. A 30-in. diam cylinder is in the works; larger ones are contemplated.

In Ardeforming, cylinders are rolled and welded, cooled to –320°F, and then stretched with gaseous nitrogen. To date, vessels made from Type 301 stainless steel have been stretched about 13 pct in diameter to yield ultimate tensile strengths of 260,000 psi.

"With suitable design and material selection," says Arde-Portland research director, Benjamin Aleck, "nominal tensile strengths should reach 400,000 psi."

What Is It?—Ardeform is essentially a cryogenic stretch-forming process. The principle behind it is an old one; cold working at cryogenic temperatures markedly improves room-temperature strength of austenitic stainless steels.

Realizing the full strength of cold-worked steels in welded cylinders or spheres proved impossible, say Arde Portland engineers. The heat of welding lowered the yield strength in the area of the weld by as much as 80 pct.

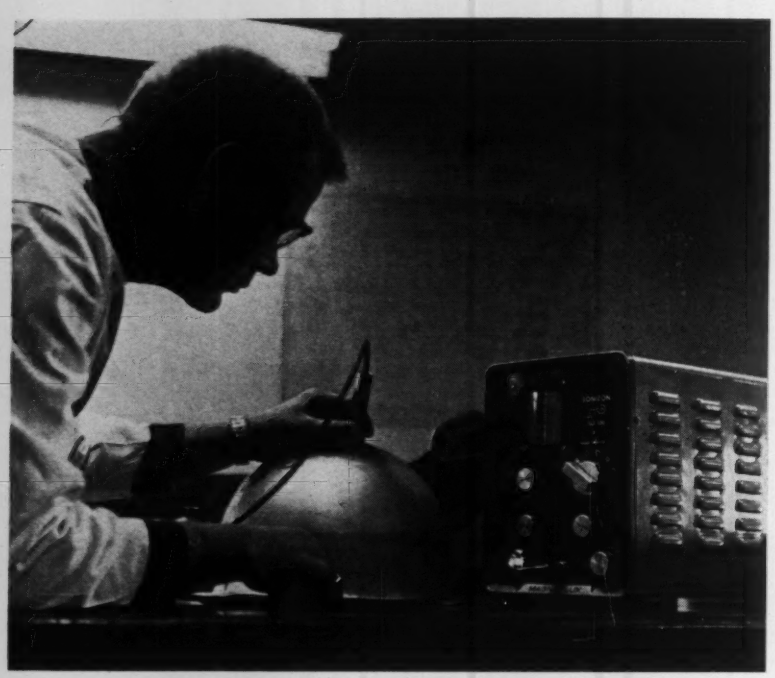
Ardeforming solves this problem, they say. The unit is first welded and then worked. Thus, the welds

as well as the base materials are strengthened.

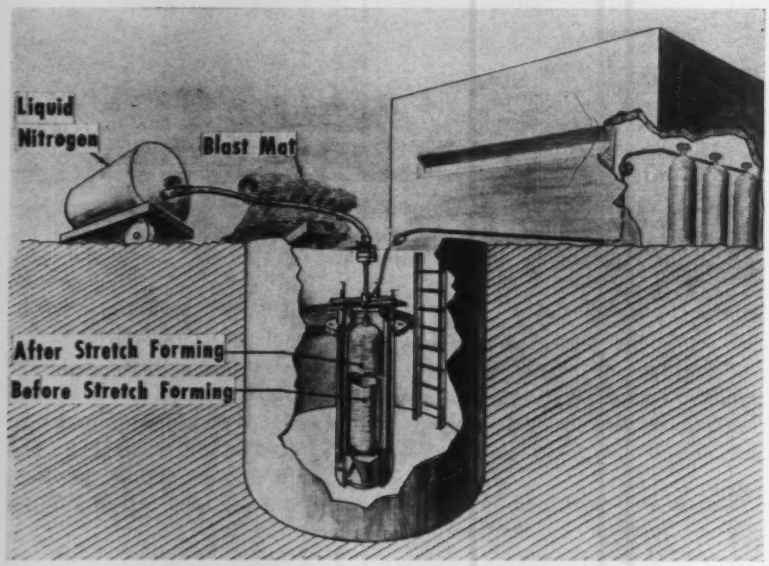
Make Preform First — The first step is to make an undersize vessel called a preform; for cylindrical vessels, annealed sheet stock is used. High quality welds must be made to permit the sizeable amount of stretching (up to 13 pct in diameter) that takes place. Arde-Portland now uses an automatic, seam tracking welding unit. Heads and end closures are made separately and welded to the cylinder.

Placing the preform inside a stainless-steel forming die in the steel-forming tank is next. The die is simply a rolled and welded cylinder of a specified diameter.

Clamping the preform to the forming tank prevents it from floating; the forming tank is then filled to a level well above that of the preform. The preform is then filled with liquid nitrogen and sealed off except for a pressurizing line which leads to a supply of compressed nitrogen gas.



TESTS ULTRASONICALLY: After heads or end closures are formed from sheet stock, technician measures wall thickness ultrasonically.



HOW TO ARDEFORM: Forming tank and preform are filled with liquid nitrogen. After preform reaches –320°F, high-pressure line is opened.

Stretch in Outdoor Pit—Stretching takes place in an outdoor pit which is covered with a blast mat. After the preform reaches liquid nitrogen temperature, the pressurizing line is opened and the preform expands by gaseous nitrogen. During stretching, a sharp rise in the pressurization rate indicates that the preform has contacted the die.

After the preform is stretched, a vent opens to release the pressure. The vessel is then removed from the forming tank, emptied of liquid nitrogen, and taken back into the plant for final machining.

Most Ardeforming to date has been with Type 301 stainless steel. And, according to Mr. Aleck, the process should also prove effective to a greater or lesser degree with other austenitic stainless steels.

Arde-Portland is also experimenting with other metals such as aluminum and titanium. Although the latter work is at an early stage, says Mr. Aleck, the results look promising.

Of the stainless steels used, Type 301 appears best suited to the new process because it achieves its maximum strength with a minimum of working. The steels with higher nickel content, such as Types 302 and 304, require greater reduction to produce a given strength. Type 302 may be preferred to Type 301 in certain applications where greater local ductility is desired in the preform.

Wide Leeway—One key advantage of Ardeform is the wide leeway in dimensional control when making the preform. For example, no attempt is made to control out of

roundness, straightness or diameter dimensions during welding. Why? Because all kinks, bends, dents, and distortions are removed during stretching. And very little final machining is required.

Moreover, preforms are welded without fixtures; weld shrinkage is permitted to occur without restraint. These conditions result in a crack-free weld with a minimum of residual stresses.

The stretching operation also serves as a proof test of the vessel. Vessels which successfully come through the stretching will also pass the final hydrotest. This self-inspecting feature means lower scrap costs for the fabricator. Scrapping a vessel right after forming, rather than after the final hydrotest, saves costs and time of intermediate operations.

A Few Drawbacks—There are some drawbacks. In certain cases, Ardeform takes more care in the design of the basic vessel or preform than do standard metalworking processes. To obtain a finished pressure vessel with spherical heads, for example, the preform heads must be carefully designed with regard to material and thickness to make sure final dimensions are those desired.

Another disadvantage is the need for dummy heads when making open cylinders. These dummy heads have to be welded on and then cut away after Ardeforming.

Putting attachments on Ardeform vessels, like design of the preform, is another operation that sometimes requires more care than in standard metalworking processes.

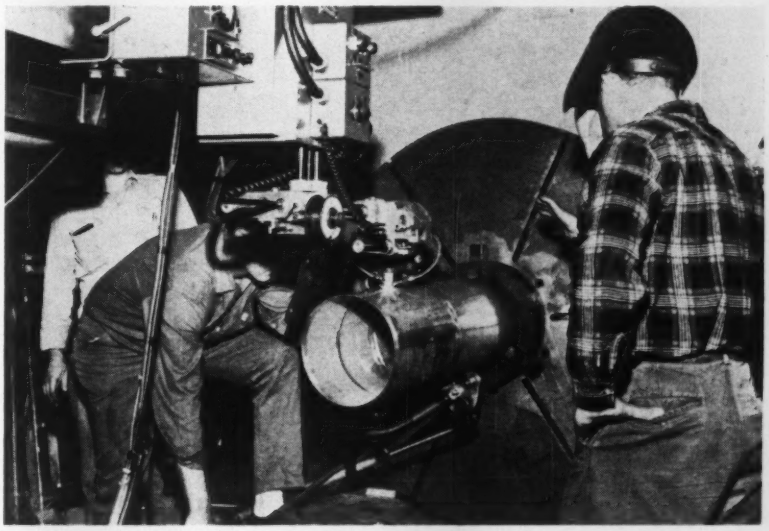
Because the preforms must come out fully to the die, certain types of attachments cannot be welded on until after the vessel is stretched and in the strengthened condition. Because the heat of welding weakens the vessel locally, it is returned to the forming pit for restretching —this time without a die—so as to bring the strength of the weld area up to that of the rest of the case.

Other Applications—Outside the aerospace field, Ardeform has several potential applications. One prospect is to use the process for making ultrahigh-strength tubing of varying cross section for special, weight-critical jobs.

Other possible jobs include making light weight structural members for portable or field-erected bridges, and box beams for large trucks and trailers.

In the chemical process industries, Ardeform is expected to find application in making pressurized storage vessels for transporting liquids and gases.

COLD STRETCH: Ardeform process hikes tensile strength of unstretched stainless steel preform (right) from 102,000 psi to 260,000 psi (left).



STRONG WELDS: It takes quality welds to withstand cryogenic stretching.

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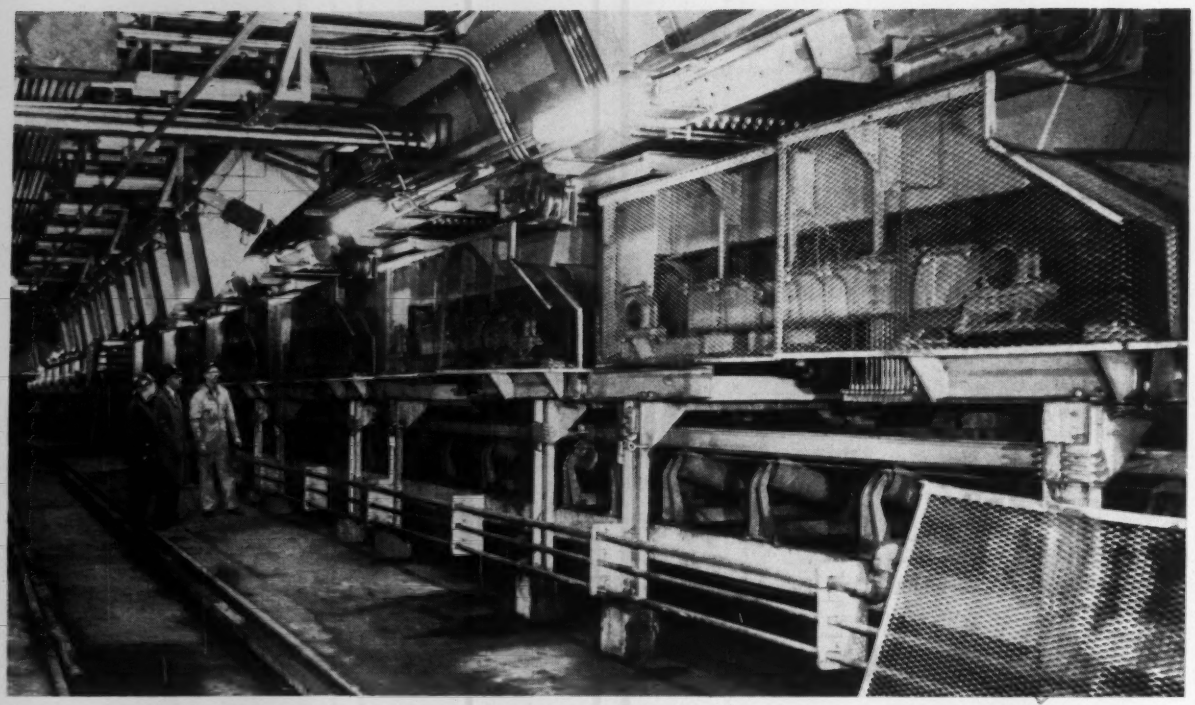


FABRICATION WINDUP: Automatic stockhouse, shown in final stages of construction, is now in operation.

Computer Feeds Blast Furnace

Fully-automatic programming has made its successful debut in a blast-furnace stockhouse.

A computer sets up pig-iron charges. It even measures the amount of water that's needed.

■ The world's first automatically-controlled blast-furnace stockhouse is now operating at the United States Steel Corp.'s Gary, Ind., plant.

Joint Effort — This computer-controlled system, designed by Meissner Engineers, Inc., Chicago, in cooperation with U. S. Steel's engineers and production specialists, automatically charges and feeds a 26.5-ft diam blast furnace.

It withdraws the various materials used in making pig iron from a series of storage bins. Then the programmed system assembles the materials in precisely metered amounts before it feeds the furnace.

All operations take place according to a preset charging plan. As a result of computer programming, fluctuations in the smelting process are drastically reduced.

Flexibility—Of course, material proportions can be instantaneously changed. All you have to do is alter the programmer's selector-switch settings.

Almost instantly after charging, the system provides a complete and accurate read-out of weights. It also immediately begins the tabulation of all charging-operation data.

For years, automatically-controlled blast-furnace stockhouses have been a dream of iron and steel engineers. J. F. Meissner, chairman of the board at Meissner Engineers, made this dream a reality.

Good Potential — Mr. Meissner says his new system can be adapted to either a new or an existing stockhouse. Why? Because the arrangement of stockbins in plant after plant bears a marked similarity to one another, despite some minor differences.

Usually, there are a number of bins in line under one of the high-line tracks. These bins contain the metallic and flux materials. A similar group of bins under an adjacent track contain the coke.

Some stockhouse arrangements differ. Central coke bins may be provided near the skips. However, these layout differences don't affect the broad principle that allows an automatic system to handle the metallic and miscellaneous materials. The automatic system can be tailored to suit any steel mill.

You even have a choice of programming methods. Input data can be supplied by a panel of switches,

dials or pushbuttons. If desired, you can use a punch-card control medium as the programming device.

Built-in Scales—Let's check out U. S. Steel's installation. A group of lengthwise metallic and flux bins are each equipped with weight-determining scale feeders.

Underneath these bins, there's a collecting conveyor. It gathers the materials and delivers them to a transfer conveyor. The latter conveyor is fully pivoted. It swings in a horizontal plane.

Coke-collecting conveyors run in an opposite direction to the ore conveyors. These coke collectors transfer to cross belts which, in turn, transfer to inclined conveyors running toward the skips.

Fully Programmed — The inclined conveyors discharge the coke onto vibrating screens. After it's screened, the coke enters a scale-mounted weighing hopper. This hopper discharges the coke into a skip bucket at the proper time.

Now, we're ready to run through the programming operations. Someone in authority sets up the desired sequence of operations. Then all input data are programmed on a panel of switches.

As each skip car arrives at its loading position, a charging operation is automatically initiated. If a metallic or flux charge is needed, the pivoted conveyor is correctly positioned in advance.

The programming unit maintains the sequence between the pivoted conveyor, the collecting conveyor and the feeders. Programmed data also control the quantity in pounds that any feeder supplies to the charge.

Weight Signals—Each feeder has its own electric scale. Controls on these scales produce an electric-pulse signal for each 50 lb of metallic or flux material withdrawn from a bin.

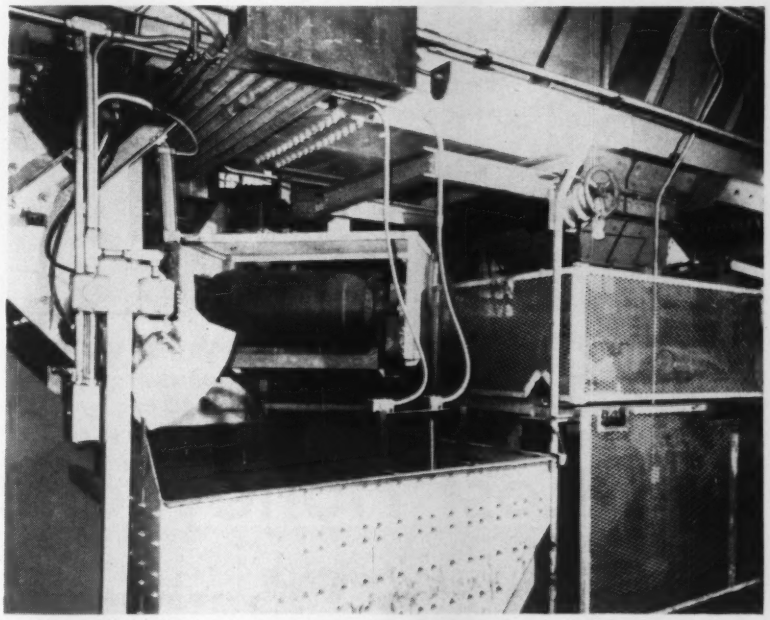
The programmer counts the pulse signals and shuts off each feeder after a preset weight has been delivered to the collecting conveyor. The feeder which contributes the smallest quantity is the first to stop. Conversely, the feeder that supplies the greatest quantity stops last.

Smooth Flow—Material flow automatically paces the stopping and starting of a feeder. Intermediate cut-off gates aren't needed.

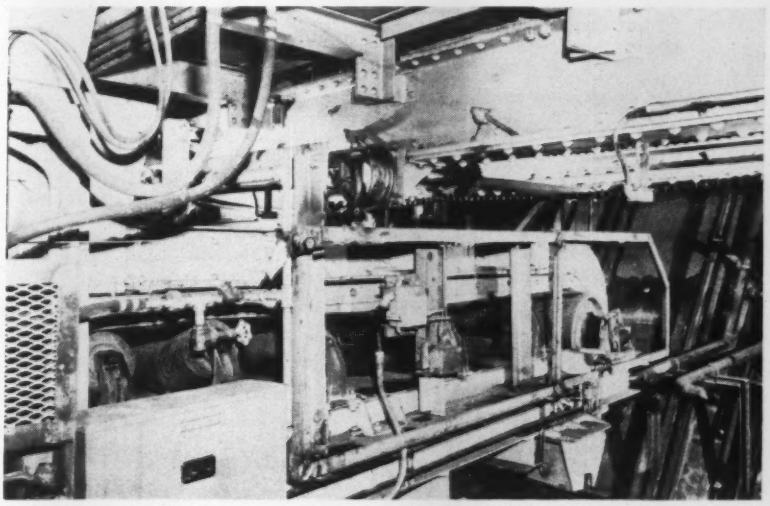
All collecting conveyors and the pivoted conveyor continue to operate a few seconds after the last and/or most-distant feeder stops. This permits these conveyors to clear the charge into the skip bucket.

When the pivoted conveyor stops, all weight data are sent to the programmer. At this time, the loaded skip car begins its ascent to the top of the blast furnace.

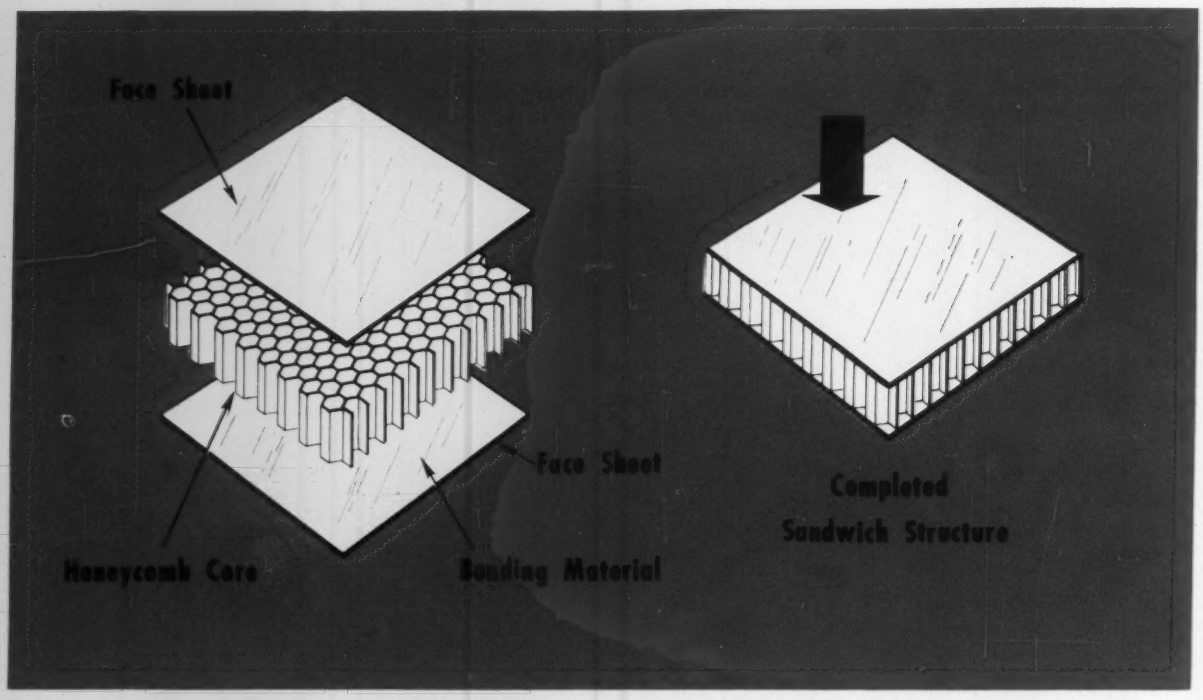
Furnace coke is charged separately in a similar manner. Weighing-hopper load cells yield an electrical-signal pulse for each 50 lb of coke that enters the hopper system.



COKE CHARGES: The coke-weighing hopper has an emergency gate (left). A vibrating screen's conveyor (center) discharges to this hopper.



PIVOTED CONVEYOR: A transfer conveyor which is pivoted and swings in a horizontal plane discharges its load into the left-hand skip car.



UNIFORM PATTERN: Honeycomb cores can be made from various materials; but cell patterns must be uniform.

Low-Cost Honeycomb Materials Offer New Design Freedom

Honeycomb cores can be made from many different materials. You can even choose paper.

Industry consumes millions of pounds of honeycomb every year. Uses range from tooling stiffeners to astronaut beds.

■ Honeycomb has the greatest strength-to-weight and stiffness-to-weight ratios of any structure known to engineering science.

Actually the term honeycomb covers a family of structural materials. Honeycomb shapes can be made from aluminum foil, stainless steel, paper, asbestos and even composite materials such as glass-plastic.

What do all these honeycomb materials have in common? In essence, a series of regularly-oriented cells form the well-known beehive pattern. Nested together, these cells may be arranged in a sequence of almost any size and shape.

Little Mass—Let's check out a normal honeycomb core. It's about 97 pct air. However, its oriented-cellular construction combines optimum strength with minimum weight.

How does honeycomb stack up against solid structural members? Here's an example. A beam of steel plate weighing 68.6 lb was replaced with a structural honeycomb that weighs only 7.8 lb. Under load, the lightweight honeycomb beam doesn't deflect any more than its steel counterpart.

Honeycomb shapes serve as the core of various sandwich structures. These structures use thin high-strength facings over the cellular cores. Structural adhesives bond the cores to facing materials.

Design Freedom—Flexibility and versatility are inherent features of honeycomb - sandwich structures. These dual advantages allow a wide range of design possibilities.

The thickness and the type of facing material can be infinitely varied. Specific design needs are also easily met through proper selection of the basic honeycomb core. You can vary the core's thickness, density and orientation. There's also lots of leeway in picking a bonding agent.

Industry consumes several million pounds of basic honeycomb core every year. The major source of this

core material is Hexcel Products Inc., Berkeley, Calif. This company makes more than 500 different types of honeycomb. Some of the final products are formed or contoured to fill a specific need.

Many Uses—Aluminum honeycomb is one of the most widely used. It serves an ever-growing market. Present uses range from raised computer floors to the special pilot couches that support astronauts in Mercury space capsules.

Heat-resistant glass-plastic honeycomb has good strength at a medium temperature range of 250°-500°F. This composite honeycomb also features excellent thermal stability.

Other advantages of glass-plastic honeycomb include low thermal conductivity and good dielectric properties. These properties make this honeycomb the standard choice for aircraft, spacecraft and missile radomes and antenna structures.

Glass-plastic serves in many other aircraft- and missile-structure applications. But its use is limited to temperatures below 500°F.

Refractory Metals — High-strength aircraft and re-entry capsules require much higher heats. To meet these needs, you've got to turn to honeycomb cores which are made from stainless alloys or refractory metals. Tantalum, molybdenum and titanium cores provide good strength at ultrahigh heats.

Now, let's check out some more-common commercial applications. Paper honeycomb-sandwich structures are filling more and more needs. Along with very light mass, these honeycombs combine low cost with paper's inherent insulating properties.

Most builders and architects express approval of the paper honeycombs. These paper cores beef up the strength of hollow flush doors, room partitions, desk tops, kitchen cabinets, exterior curtain walls and even veneered table tops.

Standard Sizes—Commercial and industrial aluminum honeycomb is available in three standard cell sizes —¼ in., ⅜ in. and ¾ in. It's made from sheets of 0.003-gage architectural aluminum foil. A variety of materials can be used to face these honeycomb cores. You can choose ceramic, marble, wood or metal for the facing sheets.

Typical uses for standard aluminum honeycombs include: Truck and trailer floors, machine-tool housings, pressurized storage tanks, boat hulls, raised panel floors for elevator cars or computer rooms, tooling cores and curtain or panel walls.

Aluminum-honeycomb cores are replacing solid laminates. A recent study proves these cores reduce overall plastic-tooling costs. They also insure rigid, lightweight structures. With honeycomb cores, the time-consuming layup work wasted in fabricating plastic tools becomes a thing of the past.

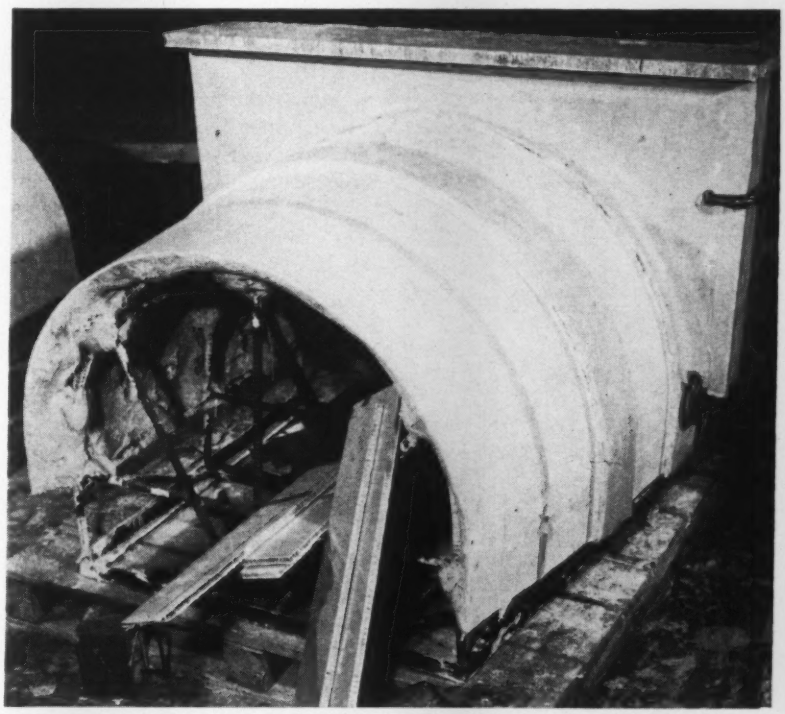
Here's a case in point. It took 25-50 plys of facing cloth to build up a special tool. The same end result can be obtained by applying only three plys of glass cloth, impregnated with an epoxy resin, on each side of a ½-in. thick aluminum-honeycomb core. This faster fabricating process isn't as costly as the conventional multi - ply method.

Dictate Strength—The compressive strength of these honeycomb stiffeners varies from 400-500 psi. Exact strength values hinge on the aluminum honeycomb's cell sizes.

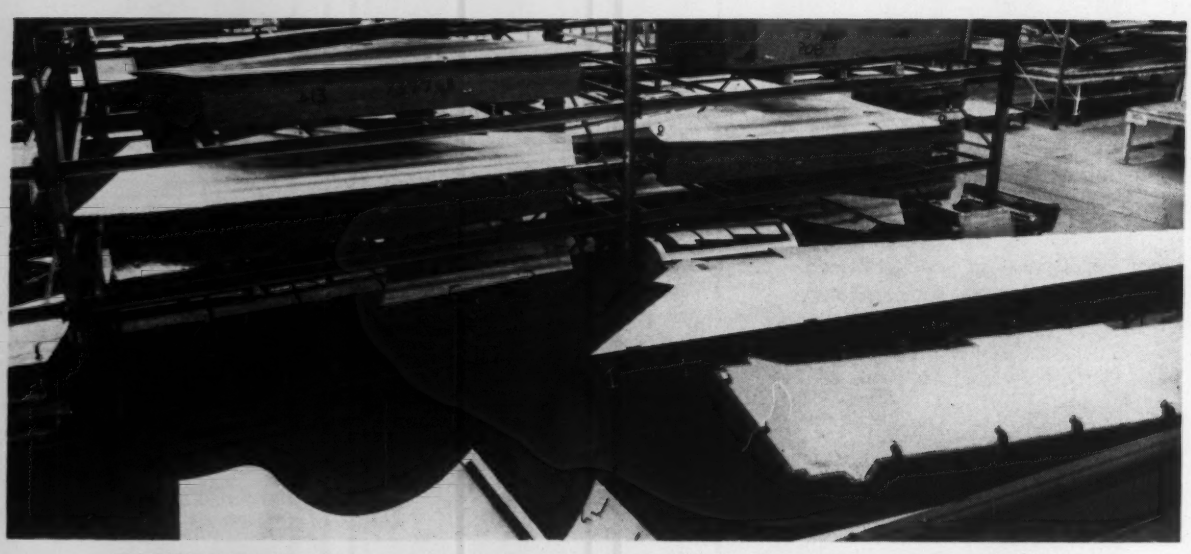
In one field test, a concentrated load of 1150 lb was applied to a laminated honeycomb-panel tool for 500 hours. Initial deflection was 0.01325 in. And the total creep was only 0.00525 in. After the load was removed, recovery was 100 pct. Ultimately, this tool withstood a proof load of 30,450 lb.

Hexcel engineers recently worked with a manufacturer who had a master tool made of plaster, aluminum and steel. It weighed 20,000 lb. The honeycomb-core tool which replaced this old heavyweight weighs in at 2500 lb.

Major Savings—Was the manufacturer pleased? Here's proof of the pudding. This company has replaced all its solid-laminated master



LIGHTWEIGHT STIFFENER: Aluminum-honeycomb core takes the place of 25-50 plys of facing cloth. This eliminates time-consuming layup work.



EASY TO STORE: Honeycomb-core panels replace solid-plastic panels on many tooling jobs.

tool stiffeners with plastic-faced aluminum honeycomb.

After using honeycomb in plastic tooling for only one full year, the company reports savings of more than $170,000.

Honeycomb tooling cores are quite useful for products which undergo continuous style changes. They serve in a wide range of auto and appliance plants.

You can alter this versatile tooling very quickly without mushrooming expenses. It also provides durability and easy upkeep in molding complex shapes.

A special raised floor demonstrates the versatility of honeycomb construction. This floor is for NASA's Data Reduction Center, Ames Research Center, Moffett Field, Calif. It will consist of 10,000 sq ft of sandwich panels, suspended 15 in. above a sub-slab floor.

Absorbs Shock—The honeycomb flooring acts as a natural energy absorber. Thus, it can support and protect up-to-date data processing equipment. In addition, the between-floor space will house signal cables, conduits, sensing devices and telephone lines. This space also serves as a duct area for the Center's air-conditioning system.

Aluminum-honeycomb panels are at home in the sea as well as on land. Honeycomb boat hulls are widely used. The Army is also testing a swimmable truck that has aluminum-honeycomb body panels.

This swimmable truck has a curb weight of 5000 lb. A standard 2½-ton capacity truck weighs in at 12,000 lb. The newcomer carries a 5000-lb payload at speeds up to 55 mph on roads and 5.2 mph in water. Buoyancy is provided by the aluminum honeycomb's air-tight cells and by polyurethane foam in all wheel-well sponsons.

Paper's Role? — Paper honeycomb has an impressive strength-to-weight ratio. For example, an 80-lb non-impregnated Kraft paper core was bonded between two 0.071-in. aluminum facings. Weighing only 451 lb, the finished panel measures 7 in. thick, 86 in. wide and 180 in. long.

Two men can lift this panel. But don't let its light weight fool you. It's a real strong structural member. It can hold up a 4800-lb car with only 3/16-in. deflection.

Paper honeycomb also resists the elements. A pre-fab test home in Madison, Wis., was built entirely of this low-cost honeycomb material. After eight years of exposure to changing seasons, this test building shows little sign of wear.

How Cell Size Affects Weight

Honeycomb Cell Size	Foil Gage	Core Material	Core Density lb/cu ft
⅛	0.001	Aluminum	4.5
⅛	0.002	Aluminum	8.1
¼	0.002	Aluminum	4.3
¼	0.003	Aluminum	6.0
¼	0.001	Stainless Steel	4.8
¼	0.002	Stainless Steel	9.6
⅜	0.001	Stainless Steel	3.4
⅜	0.002	Stainless Steel	6.7

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Audio-Visual Aid Speeds Output

Visual aids come in handy when you're teaching new assembly jobs.

One company went a step further. TV handles the visual end while ear phones spell out detailed assembly steps for each job.

■ Engineers at General Dynamics Corp., Pomona, Calif., have brought audio-visual aids into a missile plant. The training aids speed production of complex electronic assemblies by 40 pct.

Top efficiency and speed in assembling electronic equipment are always of interest to the company's planners. The plant is organized to shift into full production within hours of a national emergency.

Sound Theory—The audio-visual devices combine colored slides with a taped sound track. The worker observes the slides on an eye-level screen. At the same time, a detailed description of the assembly steps to be followed are given through ear phones.

Slides and tape are controlled by the worker. This prevents any arbitrary speedup. The worker is allowed to complete each operation at his own working pace, then move on to the next assembly sequence.

The unit picked for a controlled test of the audio-visual devices was an electronic instrument for the Tartar missile. This represented an extremely complex assembly problem, involving both mechanical and electrical production techniques.

Converts Line—First step in preparing for the tests was to convert from a multiple-station assembly procedure. Next a series of production and assembly photographs was taken and mounted as slides. These were reviewed with the workers who would be using them.

Finally, a taped series of instructions was recorded and coordinated with the slide photographs. Two new assembly workers were placed at the audio-visual station. Two others, who had worked on the production line for the same instrument but had never fabricated the complete unit, were put through a normal training procedure.

The first units built by both groups required the expected 10 hours of production time. By the fourth unit, however, the audio-visual work stations had reduced the total time required to about six hours.

Added Proof—The conventional stations showed a small improvement. However, even after five or more units had been built, the production time hovered at between 9 and 10 hours.

SPEEDS PRODUCTION: The audio-visual aid operator observes slides on an eye-level screen while listening through ear phones to detailed assembly steps. The aid offers a 40-pct gain in production time.

Three-Stage Heat-Treating Line Adds to Product Uniformity

By **F. F. Bach,** Asst. Chief Engr., and **J. Jones,** Supt. of Ball and Spike Mill, Colorado Fuel & Iron Corp., Pueblo, Colo.

Completely automatic, a 107-ft long heat-treat line steps up the wear resistance of forged steel grinding balls.

Conveyors carry these balls through a hardening furnace, into a quench tank and finally through a 750°F draw furnace.

■ One of the world's largest automatic heat-treat lines has just been placed in operation at the Colorado Fuel & Iron Corp's Pueblo, Colo., plant. This conveyorized line is more than 100 ft long. It automatically hardens, quenches and draws forged steel grinding balls.

Must Be Tough—These balls range in size from 1½-4 in. in diameter. After they're heat treated, they serve in operations such as mining and cement grinding.

Designed and built by the Sunbeam Equipment Corp., Meadville, Pa., the continuous heat-treat line features a 43-ft long conveyor-type furnace. This furnace is gas fired.

Along with the high-temperature furnace, the new line uses a 16-ft long slat-type water-quench tank. Its third main component is a 48-ft long low-temperature air-recirculating draw furnace. An enclosed automatic control panel and various safety devices round out the completely-conveyorized line.

Already, the three-unit line processes an average of 8000 lb of 3-in. diam balls each hour.

Uniform Heat Treat — These heat-treated balls must have a high degree of wear resistance. They've got to withstand constant pounding motions. Thus, heat-treat uniformity plays a key role in maintaining high-quality work.

Previously, the company quenched the balls right after hot forging. But this setup didn't produce the uniformity and consistent grain structure needed. The new line overcomes these problems. End result is a higher standard of product quality.

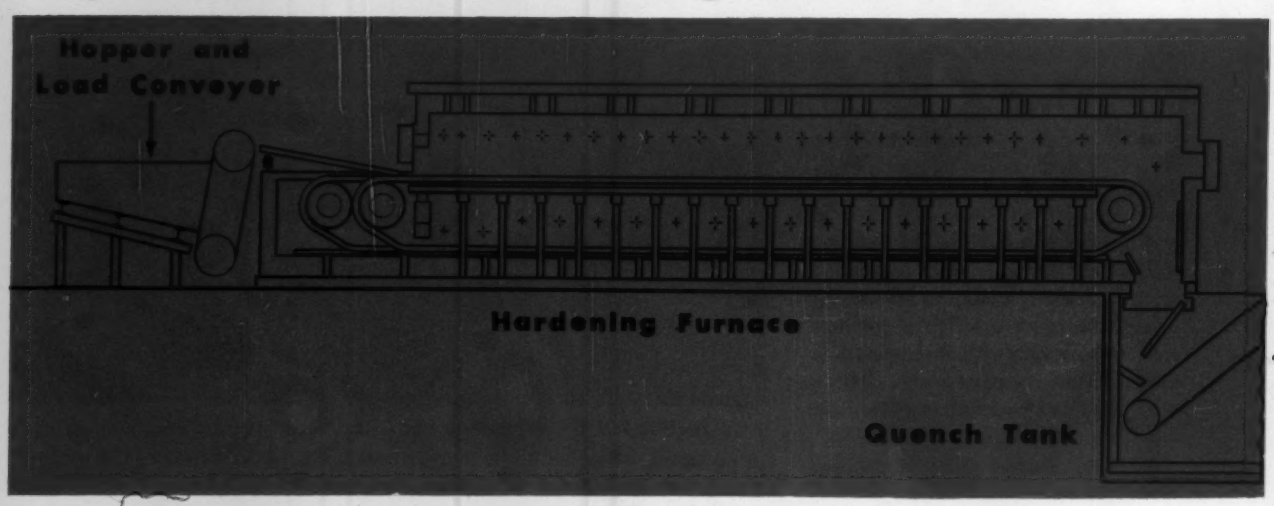
Let's check out the new installation. All work comes to the charge end of the hardening furnace. It's loaded into two hopper bins every 1½ hours.

Guides the Flow—At the discharge end of each hopper, flighted conveyor belts pick up the balls. These belts deposit the work onto inclined loading chutes. The chutes, in turn, guide the balls directly into the furnace conveyor.

Evenly-distributed belt loads are assured by a divergent-type loading chute. This chute keeps the balls from jamming as they enter the furnace.

A spring device also helps to prevent too many balls from rolling into the furnace at the same time. Located below the loading chute, this spring shuts off the conveyor meter when the chute be-

Forged Balls Enter Hardening Furnace . . .



comes fully loaded. Overloading can't occur.

Trays Interlock — Work enters the hardening furnace at room temperatures. It's carried through the furnace in two rows of 12-in. long interlocking trays. These dual trays form a full 72-in. conveyor width which runs through the furnace.

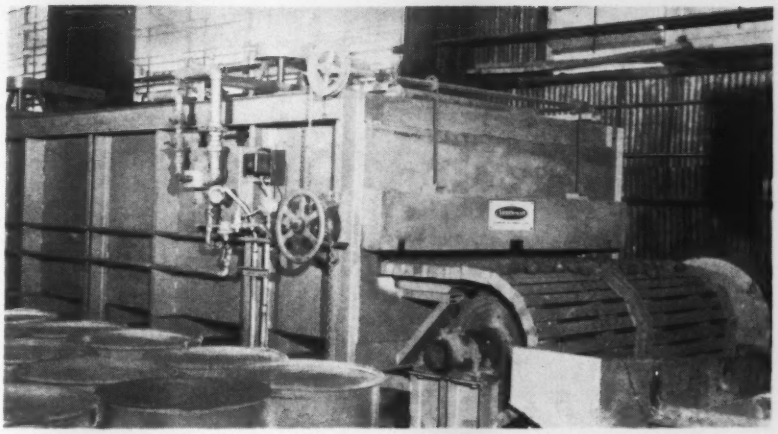
Each tray connects to two strands of alloy chain. The chains pull the trays through the heating chamber. All trays ride on alloy-steel roller rails. Heavy loads present no problems to these rails.

A sprocketed shaft drives the conveyors. Located at the discharge end of the furnace, this drive system receives its power from a 2-hp motor. The motor powers a speed reducer and speed-chain unit with a 3:1 ratio range.

Even Strain—Each 36-in. wide conveyor section has an individual air-actuated take-up unit. These units and two idler shafts reduce the chances of non-uniform stretching in the chains.

Maximum furnace temperature is 1750°F. The heat is divided into three control zones. A total of 45 nozzle-mixing burners fire from both sides of the furnace. Each zone is also over- and under-fired.

Hot combustion gases completely envelop the work. These gases are then exhausted through vents located below the conveyor.



END OF THE LINE: Dual belts drop heat-treated balls into a hopper.

As the balls leave the hardening furnace, they fall onto a 1-in. thick kicker plate before they strike the quench-tank feed belt. This prolongs belt life.

Two slat-type flighted conveyors carry the hardened parts from the 4500-gal water-quench tank. For uniform quenching, large centrifugal pumps insure a constant movement of water in the tanks at all times.

Warm Dip—Overall dimensions of the quenching equipment measure 16 ft x 8 ft x 12 ft high. The tank itself is 12 ft long x 8 ft wide x 8 ft high. Steam coils heat the water for an optimum quench.

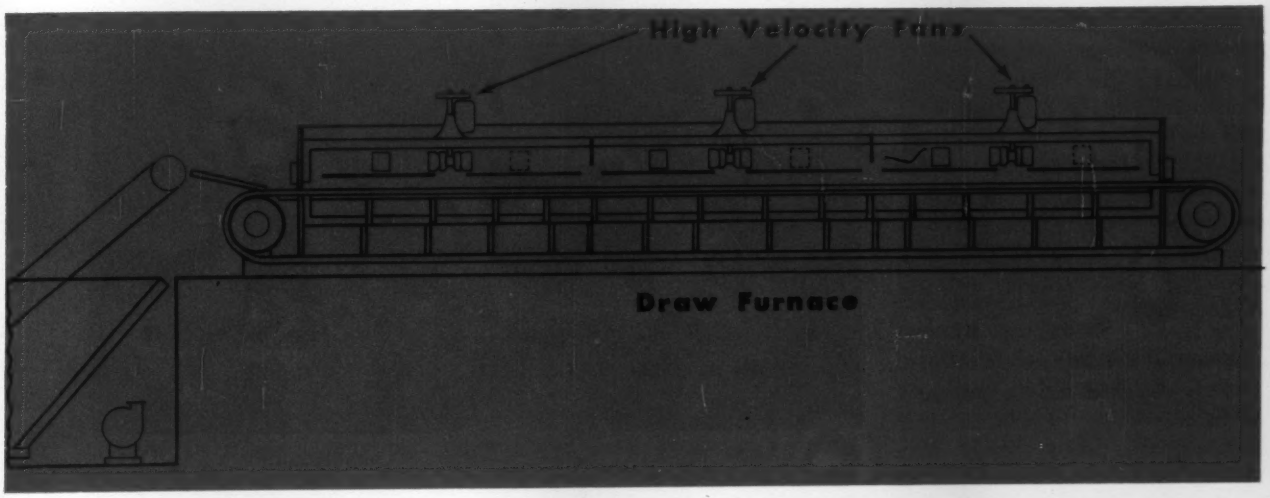
Now, we'll study the draw furnace. It's an air-recirculating type with three temperature-control zones. Overall dimensions are 48 ft x 10 ft x 10 ft high. Maximum temperature is 750°F.

As the work leaves the quench conveyor, it passes down another divergent chute. This chute guides the balls onto two conveyor belts. These belts, each measuring 36-in. wide, move the parts through the furnace.

The draw furnace tempers 8000 lb of 3-in. diam balls per hour.

Three high-velocity fans produce a total air-recirculating volume of 21,000 cfm. Each fan forces the heated air down over the work. As the hot air flows over the work, it yields uniform heat distribution.

After a Warm Dip, They're Heated to 750°F



New Press Uses Water Pressure To Shape Powdered Metals

Carbides and powdered metals are hard to shape. Large parts can also prove mighty costly.

A new vertical hydrostatic press overcomes size problems while forming complex shapes.

■ A new hydrostatic press exerts pressures far greater than those on the deepest part of the Pacific Ocean's floor. This 100,000-ton capacity giant transforms powdered metals into complex shapes. It can turn out finished shapes up to 5 ft long and 12 in. in diameter.

Recently installed at the Allegheny Ludlum Steel Corp.'s Carmet Div., Ferndale, Mich., the newcomer is actuated by only 60 gal of chemically-treated water.

Step Forward—Mr. E. C. Lauck, manager of manufacturing at the Carmet plant, reports: "This installation is the largest vertical hydrostatic press in use in the carbide and powdered-metals industry."

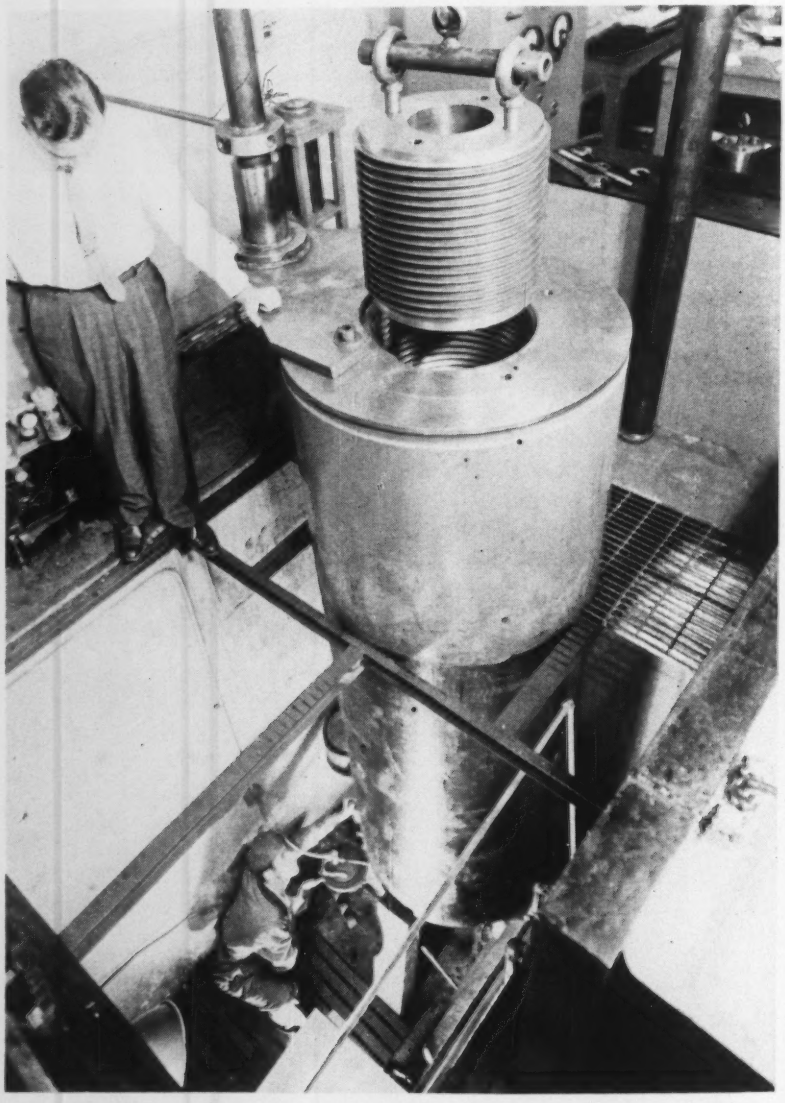
The new press was made by Autoclave Engineers, Erie, Pa. It opens the door to large powdered-metal shapes which heretofore couldn't be economically formed.

Production runs will center on long boring bars, steel-mill rolls and billets for Consutrode melting and nuclear-fuel elements. Mass production of some of the smaller carbide and powdered-metal shapes normally formed in hydraulic or pill presses is also possible with the versatile unit.

Uniform Pressure — The new press is designed on the principle of Pascal's Law. In essence, this hydrodynamic axiom states that any pressure exerted on a mass of fluid is transmitted undiminished by the fluid in all directions.

Here's how powdered-metal shapes are formed in the water-actuated press. First, the powdered metals are tightly packed in rubber molds. Then the molds are encased in perforated metal tubes.

Each powder-filled rubber mold assumes the shape of its metal-tube container. The tubes, in turn, may be cylindrical, square, rectangular or some other more complex shape.



NO LEAKS: Mr. E. C. Lauck, manager of manufacturing, Carmet Div., Allegheny Ludlum Steel Corp., checks out water lines on the new press.

Now, the metal-tube containers are ready to enter the pressure vessel. Inside the forming chamber, they're suspended on a rack.

A Little Leeway—The chamber's interior is 6 ft long and 16 in. in diameter. This chamber contains 60 gal of chemically-treated water.

After the molds are placed in the chamber, it's sealed with a large steel plug. Pressure-resistant seals on the plug prevent leakage. A large threaded nut holds the steel plug in position.

The press operator uses an overhead hoist to handle the heavyweight plug and backup nut. Large threads on the nut make tightening an easy operation.

Special Pump — Next, a high-pressure pump comes into play. This pump removes all trapped air and sends it out through a relief valve. Then the triple-piston pump continues to pump the filtered specially-treated water into the pressure chamber.

A pressure monitor makes a permanent recording of the pressure rise. The total amount of water pumped into the vessel depends on the size of the compact that's being pressed.

There's about a 50 pct reduction in volume between the unpressed powder and the finished compact. In addition, the water compresses about 10 pct at a pressure of 50,000 psi. At this pressure the water's density builds up to about 1.1 g/cc.

Experimental Fun—An idea of the tremendous compacting pressures can be realized from a story told by one of the press operators. He placed a cigarette in a waterproof bag; then he inserted the bag in the press. When the operator removed the cigarette, he found it could be driven into a wooden board.

At 50,000 psi, a total of 100,000 tons is exerted on the inside walls of the chamber. The pressure vessel itself expands slightly under this heavy force.

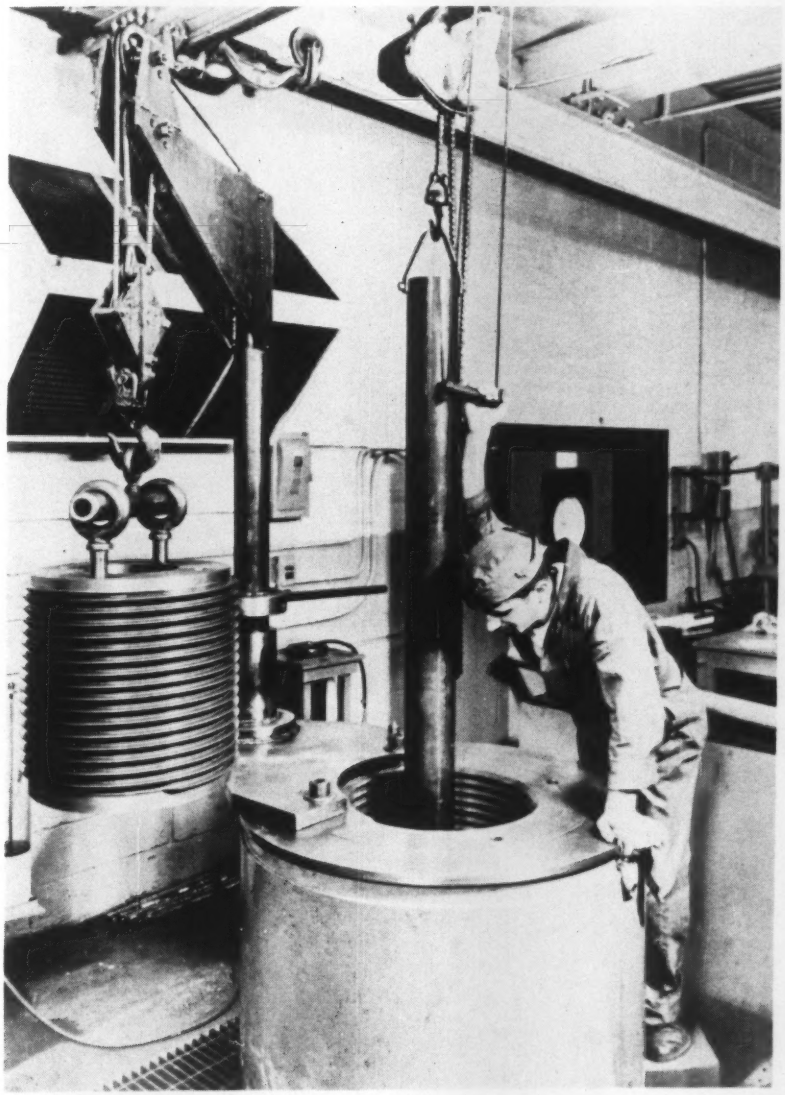
After the compacting pressure reaches a preset value, it's automatically released. The pressure then passes off through an air-operated valve.

The vertical design of the press permits heavy molds to be lowered into and removed from the pressure cylinder with an overhead crane. Repeated use of the chemically-treated water is also possible due to this design feature.

Full House—With the new compacting giant, Carmet has a full line of carbide and metal-powder production units. These facilities include pill presses, hydraulic presses and the hydrostatic press.

Hydrostatic pressing opens new market areas for the company in such fields as the processing of hard refractory metals which serve in missile nose cones.

Carmet is a major producer of cemented-carbide products. These products end up as cutting tools, blanking dies, punches, drawing dies, rock drills and other wear-resistant parts. Actually, the company was one of the pioneers with cemented carbides in this country.



GOING DOWN: Operator uses an overhead crane to lower a casing into the press. Metal casing contains a mold packed with a powdered metal.

Scraper Drags Scale From Mill

A winch-driven scraper can haul away from 1-13 yd of material at a clip.

One company uses the unit to keep scale from accumulating beneath its slabbing mill.

▪ Ingot scale accumulating beneath slabbing mill run-in tables is efficiently handled by a ½-yd DragScraper system at Inland Steel Co.'s East Chicago plant. A crane conveys the ingots from the soaking pits to ingot cars. The cars in turn whip the 2400°F ingots to the mill tables.

Scale falls between the rollers as the tables deliver the ingots to the slabbing mill. The DragScraper, elongated to fit between the narrow tunnel walls, travels on a 182-ft haul to remove the scale and scrap accumulating with the passage of each ingot over the rollers.

Clears Tunnel—The scale accumulates uniformly throughout the tunnel. Large pieces of steel coming from the scrappy end of the ingots fall near the hopper opening thus requiring only a short haul to the hopper.

The scale removed by the scraper drops into the hopper at the end of the tunnel. The dumping action is automatic. The unit deposits its load when passing over the hopper opening.

Side dump cars below the hopper receive the mill scale. When filled, the car is switched by a small diesel-powered locomotive onto another track leading to a quenching pit just outside the mill building.

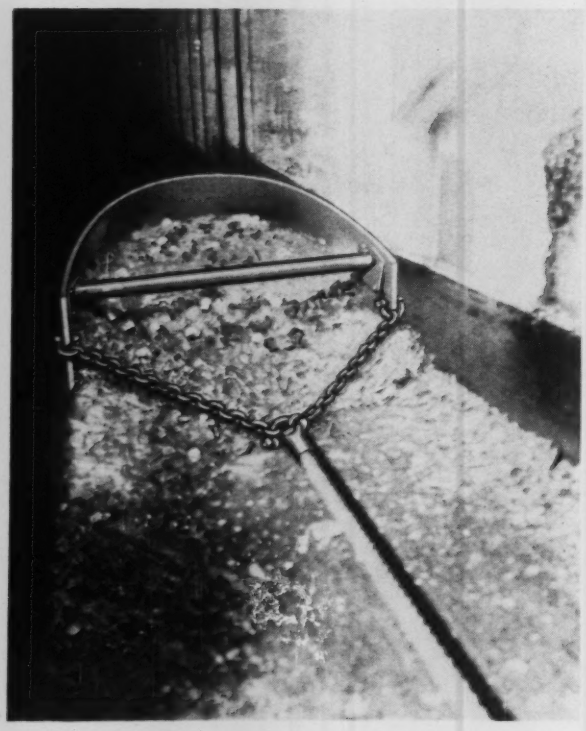
Scale is dumped into the water-filled pit, cooled, then removed by crane to gondola cars. A screen placed atop the car permits under 6-in. scale to pass through and ends up back at the blast furnaces. Scale over 6 in. in size is sent, by a separate car, to the open hearths.

Simple Setup—The DragScraper is operated by duplicate single-drum winches, electric motors and gear reducers, mounted on integral steel bases. The units are located at each end of the scale trough.

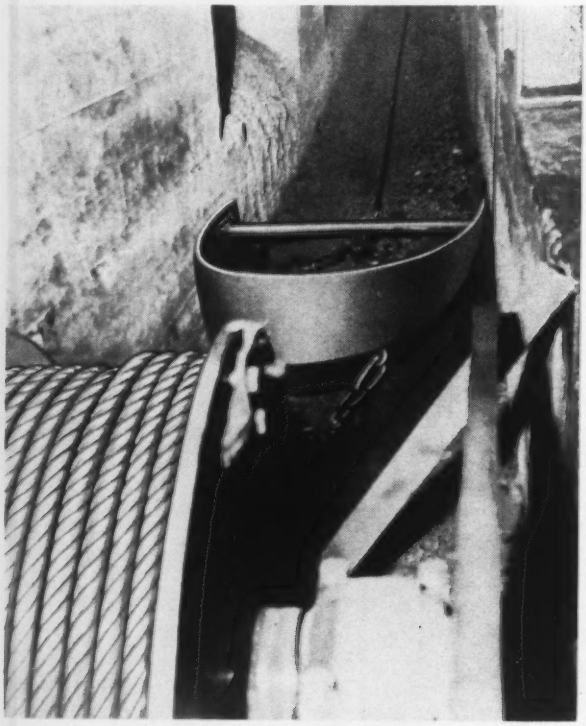
Dynamic breaking used along with direct current motors control slack in the cables. Gear limit switches, driven from the drum shafts, control the scraper's travel between preset points.

Although the unit can continue its cycle unattended, it is manually controlled and usually is shut down after a haul to await further accumulation of ingot scale. About 10 tons per hour is easily handled.

The amount of material moved is not staggering. However, the system prevents a buildup of scale. Accumulations would eventually cause a shutdown of the slabbing mill to wait cleanup of the scale.



CLEARS A PATH: The scraper hauls its load of mill scale to a hopper. Dump cars then whisk it to pits.



DUAL POWER: Single drum winches, located at each end of the tunnel, control the scraper's bite.

RED CIRCLE ORDERS SHOUT RUSH and EVERYBODY GETS BEHIND THEM at Acme-Newport

Demand *Red Circle Service* for filling the low spots that occasionally appear in your inventories. Acme-Newport clearly marks your rush orders with a bright red circle that gains preferential handling in every department. Modern equipment, flexibility of scheduling and splendid employee cooperation combine to speed your orders through the mill, while maintaining every quality control for which Acme-Newport is recognized in all its steelmaking. If you need it yesterday, call us today, and it will be shipped surprisingly soon!

Steel

PRODUCTS OF ACME-NEWPORT STEEL

- Hot Rolled Steel in Coil
- Hot Rolled Pickled Steel in Coil
- Hot Rolled Sheets
- Hot Rolled Pickled Sheets
- Cold Rolled Steel in Coil (*full hard only*)
- Cold Rolled Sheets
- Alloy Sheets and Plates
- Plates (5/16" *and lighter*)
- Electrical Sheets
- Electric Weld Line Pipe
- Spiral Welded Pipe

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NEWPORT, KENTUCKY

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NEW PATENTS

Reduces Iron Ore

Reduction of iron ores containing ferruginous clays, G. Hahn and S. I. Ali, July 4, 1961. In the production of metallic iron from ores containing hard-to-reduce chloritic clays, the pulverized ore is roasted in an excess of an oxygen-containing gas at 900-1000°C. This decomposes the chloritic clay into iron compounds susceptible to reduction. U. S. 2,991,172.

Refining Pig Iron

Metal-refining method and apparatus, B. Trentini and P. Vayssiere (assigned to Institut de Recherches de la Siderurgie Francaise, St. Germain, France), July 4, 1961. In this method for refining pig iron most of the heat evolved by carbon oxidation in the melt is absorbed by the molten-metal bath. As a result, efficiency and yield increase. U. S. 2,991,173.

Stainless Alloy

Hardenable stainless-steel alloys, W. O. Binder and C. M. Brown (assigned to Union Carbide Corp.), June 27, 1961. A transformable heat-hardenable, austenitic stainless-steel alloy consists of 15-18.5 pct Cr, 10-22.5 pct Co, up to 0.2 pct C, up to 1.5 pct Mn, up to 0.75 pct Si, up to 0.15 pct N, and the balance all Fe. U. S. 2,990,275.

Mixing Method

Method of and apparatus for concurrently disintegrating and mixing together different solid particles, F. B. Sellers and H. M. Chapin (assigned to Texaco Development Corp.), July 4, 1961. A fluid-energy technique simultaneously comminutes and admixes different materials. One example is the preparation of a magnetite-coke-limestone charge suitable for reduction in a blast furnace. U. S. 2,991,187.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Gage Control

An automatic gage control for cold-strip rolling mills is described in a two-page bulletin. It shows how equipment is used to reduce downtime and achieve greater yield of usable strip from each ton of metal that is rolled. (General Electric Co.)

For free copy circle No. 1 on postcard

Phenolic-Molding Aid

Guidelines for designing with phenolic-molding compounds are available in a six-page illustrated folder. It lists typical applications and design properties of these materials. It also compares their costs with those of metals. (Chemical Materials Dept., General Electric Co.)

For free copy circle No. 2 on postcard

Multi-Purpose Motors

Announcing a new six-page bulletin covering integral-horsepower motors, the manufacturer states that the motors are generously designed for such "work-horse" jobs as driving compressors and pumps. The bulletin contains specifications, drawings, speed-torque curves and dimensions. (Kingston-Conley, Inc., a subsidiary of Howell Electric Motors Co.)

For free copy circle No. 3 on postcard

Residual-Stress Gaging

The reader interested in stress measurements on metallic films will want to know about a new instrument that accurately determines residual stresses. All the details are available in a concise brochure that also discusses theory and importance of residual stress. (Joseph B. Kushner Electroplating School)

For free copy circle No. 4 on postcard

Case for Fiberglass

Outlining the many uses of reinforced fiberglass in industry, a new booklet also compares this versatile product with other popular fabricating materials. It points out specific advantages to be gained by using reinforced fiberglass in installations commonly calling for metal construction. (Glastronics)

For free copy circle No. 5 on postcard

Welding Tips

"Handbook for Welding Low Alloy High Tensile Steels" is a valuable 64-page reference. With the cooperation of every major steel producer, the publisher has compiled a comprehensive guide for the fabricator. (Alloy Rods Co.)

For free copy circle No. 6 on postcard

Aerospace Testing

Recently released is an illustrated brochure that contains on-the-site photographs of aerospace support and test equipment. It also covers nuclear equipment and installations, expansion joints, bellows and surge suppressors. (Cook Electric Co.)

For free copy circle No. 7 on postcard

Injection-Molding Data

Injection molding machines are the subject of an attractive new bulletin. It covers design features, both standard and optional, as well as specifications and die-space dimensions. (Farrel - Birmingham Co., Inc.)

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Frequency Telemetering

Eight new pages detail the uses of telemetering systems and a new,

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FREE LITERATURE

completely - transistorized analog system. Schematics back up information concerning the new system's extreme flexibility. (General Electric Co.)

For free copy circle No. 9 on postcard

Lists Vehicle Line

Printed in full color, eight pages in length, a new catalog illustrates and describes a 1962 line of three-wheel utility vehicles. Equipped with new die-cast aluminum engines, these units boast more power and speed for materials-handling jobs and on-street uses. (Cushman Motors, a subsidiary of Outboard Marine Corp.)

For free copy circle No. 10 on postcard

Furnace Controls

Hot off the press is a new catalog on industrial-heating, furnace-control systems. It covers automatic control for open-hearth furnaces, glass tanks, reheating and annealing furnaces and soaking pits. In fact, it's meaty enough to interest the design engineer. (GPE Controls, Inc.)

For free copy circle No. 11 on postcard

Nitrogen Production

Production of pure nitrogen from nitric-acid tail gas results from a platinum-metal catalytic process. The details on this process comprise just one of the articles in a new technical bulletin. (Engelhard Industries, Inc.)

For free copy circle No. 12 on postcard

Grinding Standard

The Grinding Wheel Institute announces a new publication entitled "American Standard Specifications for Shapes and Sizes of Diamond Grinding Wheel, Hand Hones and Mounted Wheels." This document won approval as an American Standard on February 8, 1961. It contains thirty-seven pages of information on diamond grinding wheels.

For free copy circle No. 13 on postcard

Creative Framing

A new booklet unveils a variety of do-it-yourself ideas for creative framing of storage racks, shipping containers, tables and platforms. It concisely presents the story behind the simplicity of a new slotted-angle framing material. (Acme Steel Co.)

For free copy circle No. 14 on postcard

Concrete Testing

Using improper procedures in the casting of concrete test cylinders invariably produces low and erratic compressive strengths. At least that's the contention of The Master Builders Co. which has just released an instruction sheet covering approved concrete-cylinder casting procedures.

For free copy circle No. 15 on postcard

Aluminum Forgings

Answers to the most-often-asked questions about aluminum forgings are given in a new brochure. It explains how aluminum forgings are made, and the difference between aluminum and steel forging. It also spells out common problems encountered in forging aluminum. (Reynolds Metals Co.)

For free copy circle No. 16 on postcard

For Steel Designers

Three new grades of high-strength forming steels are the subject of three recently-released booklets. Each outlines general and technical data on one of the new steels. (Jones & Laughlin Steel Corp.)

For free copy circle No. 17 on postcard

Tiny Two-Way Valves

Just published is a two-page illustrated bulletin with information on a new series of miniature two-way valves. These units provide high capacity in a small envelope size. Bubble-tight shutoffs are another valuable feature. (Airmatic Valve Co.)

For free copy circle No. 18 on postcard

Surface Grinder

In its eight illustrated pages, a new brochure gives all the details on a 6 x 18-in., precision hand-feed surface grinder. (Landis Tool Co.)

For free copy circle No. 19 on postcard

Reduce Power Costs

"Design or Modernize Heavy-Duty Grinding Mills" is a new 4-page bulletin. It pinpoints the cost-saving potential of air-actuated clutches used in heavy-duty, grinding-mill drives. (Fawick Corp.)

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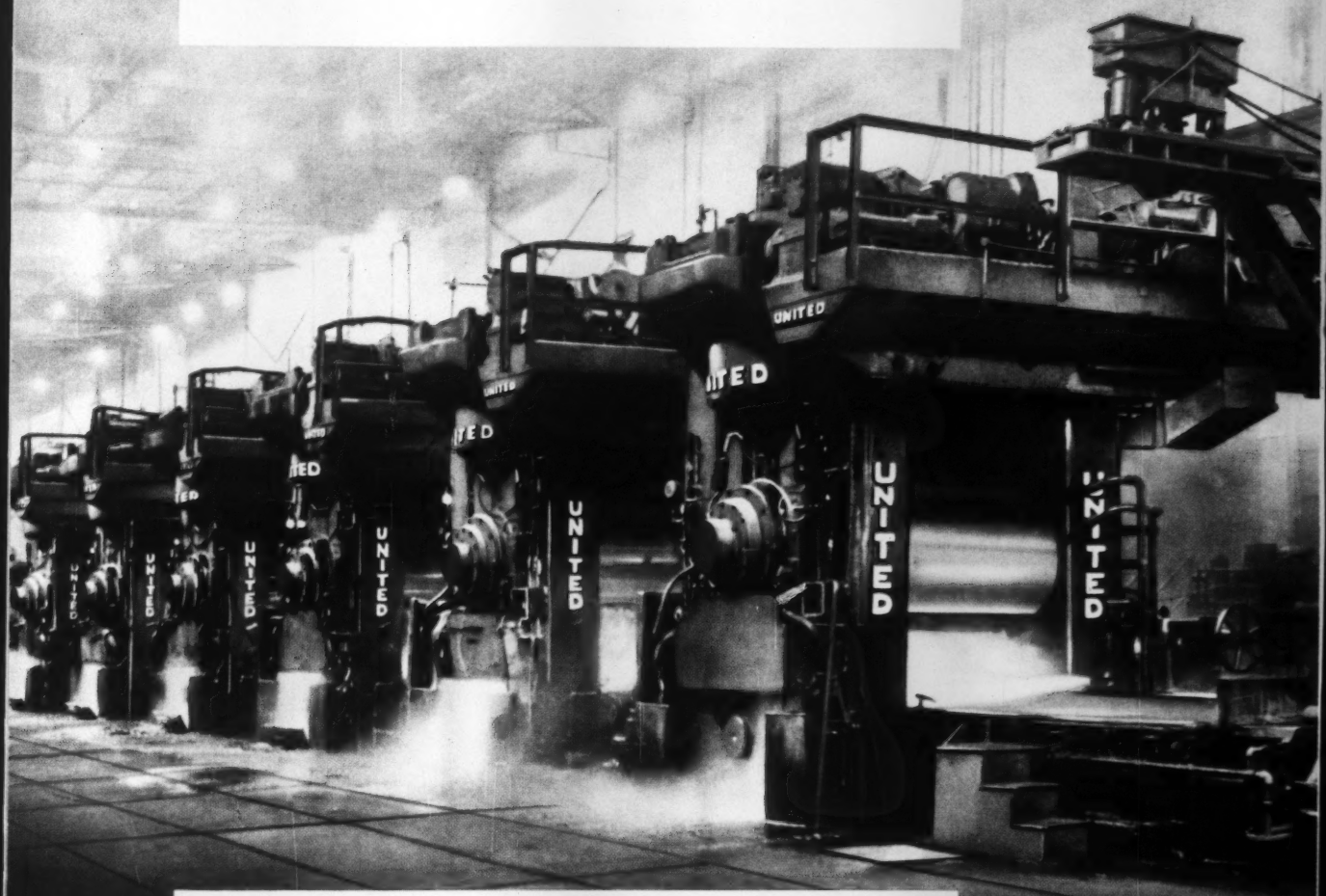

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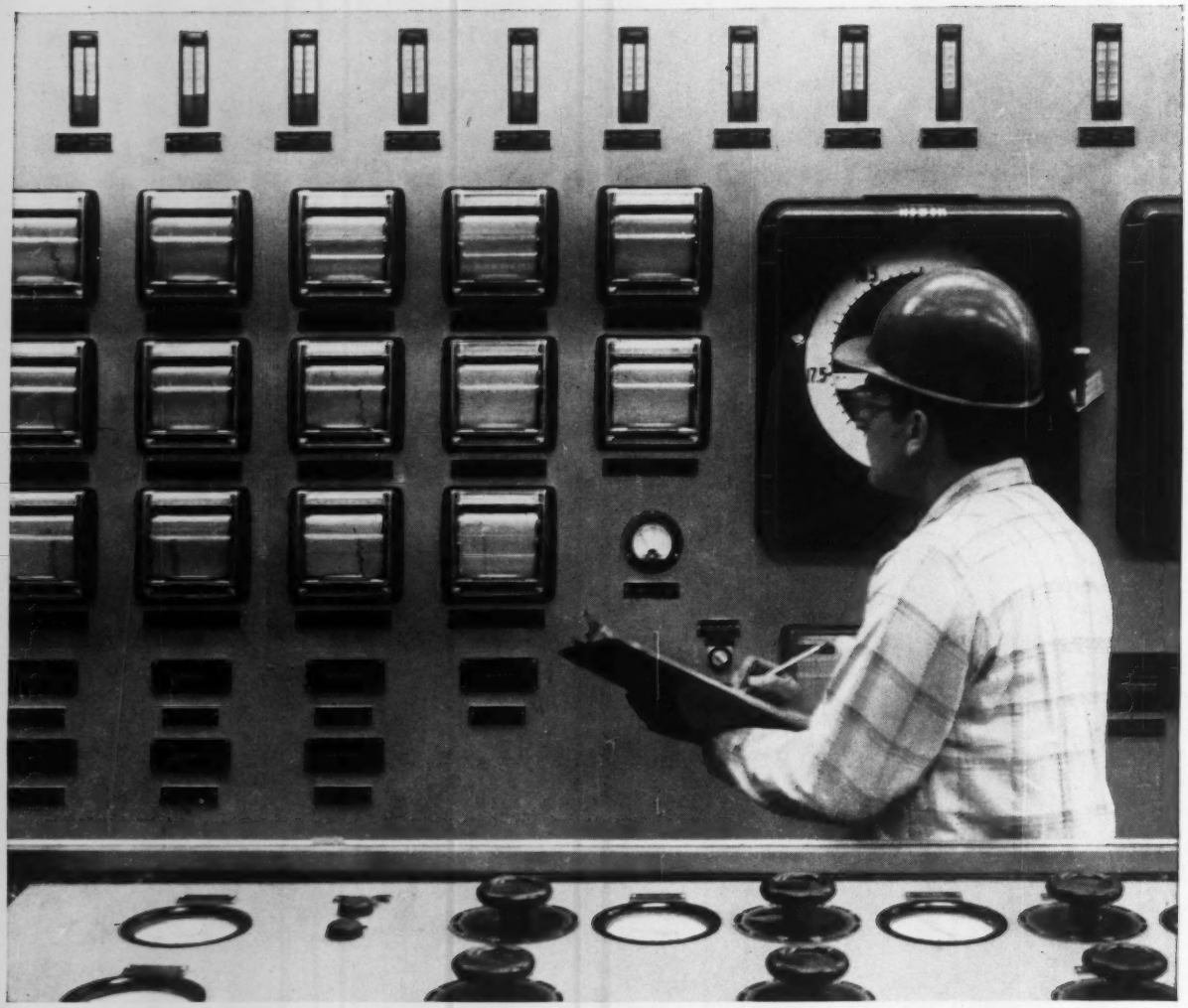

Foxboro control panel on Dwight-Lloyd Sintering machine at U. S. Steel's South Works, Chicago. Variables recorded by Foxboro Consotrols include temperature, pressure, level, flow and weight. Plant was designed and built by McDowell Company, Inc., Cleveland.

It's Foxboro "small-case" Consotrols for new U.S. Steel Sintering Plant

Savings in panel space — and in control room construction costs — were both achieved at U. S. Steel when they installed Foxboro "small-case" Consotrol* instruments for their new 5000 ton-a-day sintering machine at South Works.

Foxboro Consotrol Recording-Control Station met every U. S. Steel specification. Consotrols provide precise, dependable control — plus full-scale 4-inch records — in only one quarter the panel space required by conventional 12" instruments.

But panel savings are only part of the Consotrol story. Maintenance is easier, too. Not to mention accurate, dependable, trouble-free performance. Bulletin 13-18 has the complete story — write for it. The Foxboro Company, 808 Neponset Avenue, Foxboro, Massachusetts. *Reg. U. S. Pat. Off.*

FOXBORO

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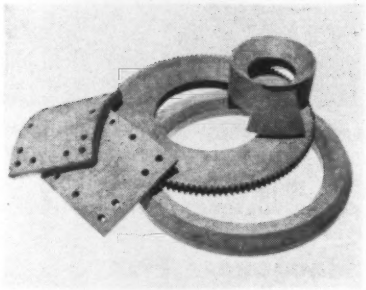
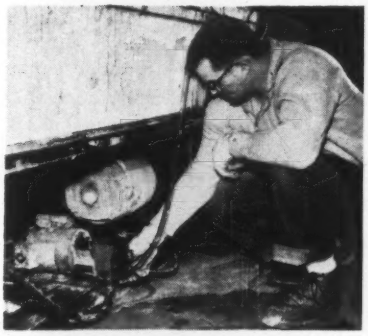
New Materials and Components



Brake Material Resists High-Temperature Fading

With a new friction material, positive control of brakes and clutches is possible at temperatures up to 1000°F. It particularly suits severe-duty service. Average coefficient of friction is 0.56 at 350°F, 0.62 at 600°F, and 0.53 at 1000°F. As you can readily see, there's negligible friction fade. Also, rate of wear is well within the acceptable limits for materials at high-friction levels. Although it's essentially organic, the rigid new material also contains zinc particles. It's made in blocks, facings and sheets to suit most industrial and commercial uses. (Johns-Manville)

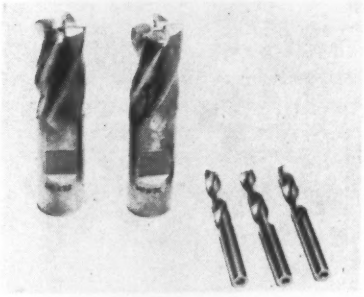
For more data circle No 21 on postcard, p. 77



Packless, Sealless Pumps Halt Motor Burnouts

Two pump-motor burnouts a month is a mighty expensive proposition. The pumps power 10 machines for silver plating copper wire. The plating solution circulates through a filter at each machine. However centrifugal pumps always leaked. The plating solution attacked every stuffing-box material that was tried. As a result, motors burned out. Pumps without stuffing boxes, glands or seals were needed to save the day. With these units, no metal contacts the fluid. Nor does the shaft enter any space through which the fluid passes. Since there's no shaft seal, fluid can't leak along it. (Vanton Pump & Equipment Corp.)

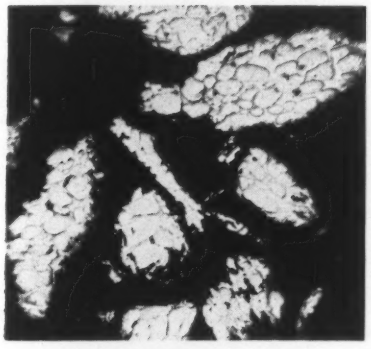
For more data circle No. 22 on postcard, p. 77



Machinable Tool Steel Boasts Carbide Hardness

"Do-it-Yourself," cutting-grade carbide combines hot hardness with easy fabrication. It consists of ultrahard carbide dispersed in a high-speed steel matrix. In the annealed, as-received state, this fully-sintered composite can be drilled, tapped, milled or even filed. But once it's heat treated to 70 Rc, the tool blank behaves like a solid carbide. Service life equals that of carbides. However, metal-removal rates and tool life are much higher than those of high-speed tools. On semihard alloys, cutting speeds range to 200 sfpm without tool damage. (Sintercast Div., Cromalloy Corp.)

For more data circle No. 23 on postcard, p. 77



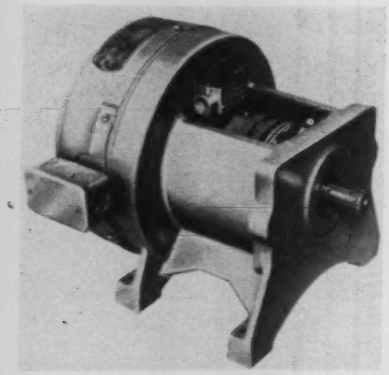
Pre-Alloyed Powders Block Out Lethal Radiation

Pre-alloyed, heavy-metal powder containing tungsten, nickel and copper is now available in any desired composition. These high-density alloys are invaluable as shields and containers for radioactive materials. Absorbtion of X rays and gamma rays is generally proportionate to the density. With densities around 17 gm per cc, the new powders are about 1½ times as effective as lead against hard-radiation penetration. Gyroscope rotors, vibration-damping devices, governors, flywheels and rocket nozzles are other uses for the alloys. Test pieces exhibit good structural uniformity, machinability, density, tensile strength and the absence of hard and soft spots. Laminations are eliminated. (Astro Alloys Corp.)

For more data circle No. 24 on postcard, p. 77

Machine Drives

Basing motor sizes on average-power needs instead of peak-load demands is fine, if you can get away

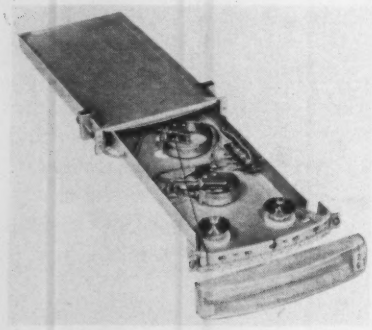


with it. And new machine drives let you do just that. They store energy to meet momentary load surges up to 10 times greater than normal. The drives include an axial air-gap motor and an integral clutch-brake coupling. Inside the motor, a constantly-spinning rotor creates a flywheel effect to store kinetic energy. When the clutch engages, the output shaft reaches top speed almost instantaneously. In addition, coasting is practically eliminated. The brake automatically clamps the output shaft and its load. Practical effect of the drive is a faster cycle time. (Ferguson Machine Co.)

For more data circle No. 25 on postcard, p. 77

Provides Correct Scale

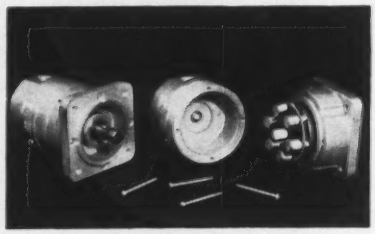
Changing scales to suit changing process requirements is a simple matter with a new pneumatic receiver. It provides multiple scales that are easily positioned. Scales are printed on Mylar tape and stored on spools. Width of each is 4½ in. When a change in process requires new scale values, you simply rotate the correct scale into view. Minor deviations of the indicating pointer from normal operating conditions can be detected quickly from a distance. This feature reduces reading time and cuts reading errors. (United States Gauge Div., American Machine & Metals, Inc.)



For more data circle No. 26 on postcard, p. 77

Senses Speed Changes

Negligible friction promotes high repetitive accuracy in a new centrifugal switch. Developed to replace units which depend on complicated frictional relationships between weights, bearing shafts and coil springs, the newcomer senses speed interlocking, sequencing and signaling. Heart of the new switch is a simple one-piece steel disk with weights fastened directly to it. Centrifugal force of the weights overcomes rapid decrease of the spring force. The result is a snap action at the operating speed. Normal operating speeds range from 900-4000



rpm. Factory-adjusted standard units operate at 1100 and 2200 rpm. (Square D Co.)

For more data circle No. 27 on postcard, p. 77

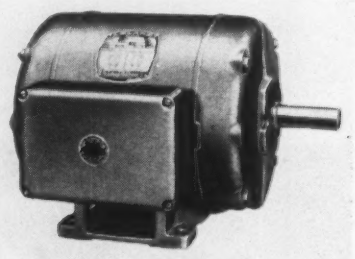
Manganese Flux

A new, agglomerated-alloy flux tackles submerged-arc fabricating or rebuilding of 12-15 pct manganese-steel parts. It offers upkeep-cost economies by reducing material costs, and increasing deposition rates and welding speeds. (The Lincoln Electric Co.)

For more data circle No. 28 on postcard, p. 77

All-Purpose Motors

Ranging from 1-5 hp, units in a line of single-phase open motors have starting torques from 250-350 pct of full-load torque. Overload capacities average 250 pct of full-load torque. The motors are designed for general-purpose applications. Driving air conditioners, blowers, compressors, pumps or coolers are just a few examples. Of course, designs are available to suit all standard voltages and frequencies. The units operate at speeds ranging from 950-3450 rpm, handling either continuous or intermittent duty. Thermal overload protection is an optional feature. (The Leland Ohio Electric Co., a subsidiary of Howell Electric Motors Co.)



For more data circle No. 29 on postcard, p. 77

QUANTITY PRODUCTION OF GREY IRON CASTINGS

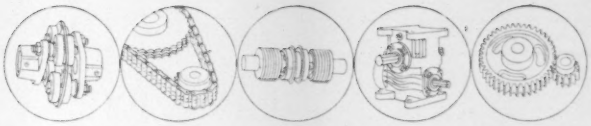
ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND FOUNDRY

DIVISION OF GORDON STREET, INC.

CHATTANOOGA 2, TENN.



Morse has an answer to every industrial drive problem under the sun

From oil rigs, boats, and cars to missiles, mowers and machinery—look first to Morse for transmission of motion or power. You'll get impartial engineering help and immediate delivery on a complete range of products: Basic Drives, Speed Reducers, Couplings, and Clutches. Basic Drives alone include stock gears, roller chain, silent chain, "Timing"® Belt, and Hy-Vo® Drives. You'll find your Morse man in the Yellow Pages. Or write: Morse Chain Co., Dept. 33-81, Ithaca, N.Y. Export Sales: Borg-Warner International, Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ont.

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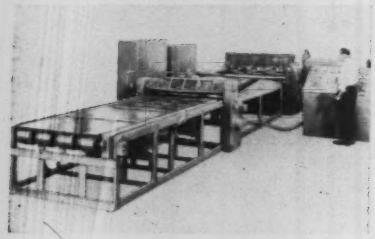
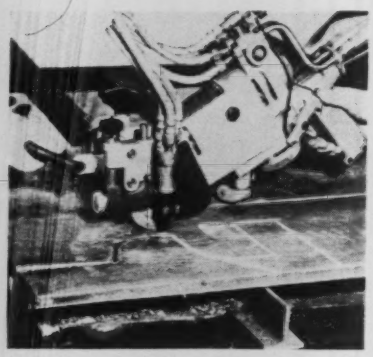
New Equipment and Machinery



Automatic Line Decoils and Cuts Sheet to Length

Here's a new automatic decoiler and cutoff line to provide highly-accurate cut lengths at low initial cost. Its money-saving ways should appeal to users of mild, cold-rolled steel sheet. In the first place, coil stock costs less. And with coils, there's less scrap loss, lower labor and handling costs and fewer operations. The basic line consists of a reel, straightener, hump table, shear and a sheet-conveying apparatus. (Lennox Industries Inc.)

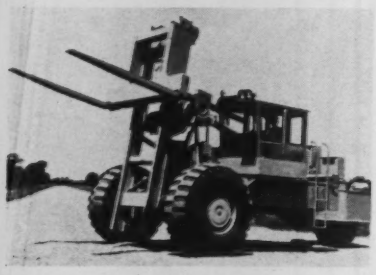
For more data circle No. 30 on postcard, p. 77



Lightweight Flame Cutter Features Clutch Control

Fast, clean cuts in light-gage metals or 2-in. plates are duck soup for a new flame-cutting machine. It's the only one of its size that comes equipped with a clutch. This allows instant, free-wheeling control for hand-guided contour cutting. Less than 19 lb complete with torch, the newcomer is the lightest unit on the market. It's easy to move from job to job and it handles a variety of assignments. These include straight-line, bevel, circle, and some contour cutting. Speeds range up to 30 ipm. After lighting the torch, one hand is used from the start to finish of any cut. Not only does this hand guide the machine, it also manipulates all operating controls. (Linde Co., a division of Union Carbide Corp.)

For more data circle No. 31 on postcard, p. 77



Diesel-Electric Fork Truck Lifts 40,000-lb Loads

A new diesel-electric fork lift handles up to 20-ton loads on paved or unpaved surfaces. Powerful wheel drive and wide-base tubeless tires ease the big truck over rough terrain. Its all-electric system does away with clutches, transmissions, drive shafts and hydraulic lines. Instead, individual gearmotors power the hoist, rack tilt and rear-wheel steering. All controls are governed by simple switches. These form part of a console which revolves along with the operator's seating unit. (R. G. LeTourneau, Inc.)

For more data circle No. 32 on postcard, p. 77

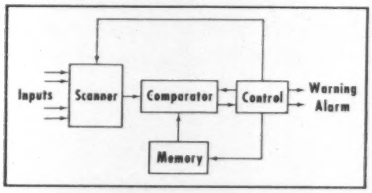
High-Speed Arc Machine Welds Thin-Gage Metals

Although it's a new entry in the thin-gage welding field, this versatile welding unit appears to have exceptional speed at low cost. The package includes a 200 amp, silicon-diode rectifier for power, a compact wire-drive system and an unusual straight-through torch. With standard gearing in the drive system, speeds range from 90-424 ipm. However, modified gearing provides speeds up to 1170 ipm. Since both drive rolls operate, positive feed is assured. Micrometer adjustments control the fine feed. Torch weight is only 22 oz; but the unit accommodates wire sizes in mild steel or stainless from 0.025-0.047 in. Rated for a 100 pct duty cycle at 200 amp, the torch comes with a 15-ft welding cable, a gas hose and an electric control cable. Both wire-drive system and straight-through torch come separately. (Westinghouse Electric Corp.)

For more data circle No. 33 on postcard, p. 77

Sounds the Alarm

Here's a system that monitors hundreds of points on complex industrial jobs to detect abnormal conditions. If trouble occurs, the

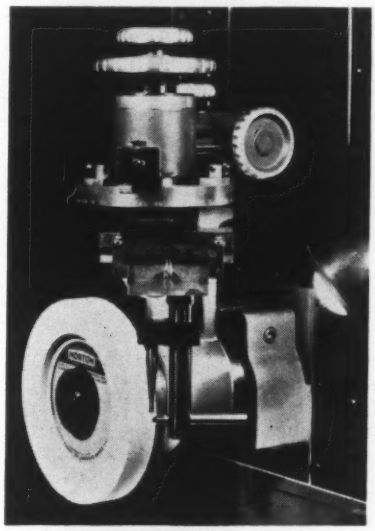


system sounds the alarm and starts corrective action immediately. Memory circuits store high and low alarm limits. By examining each point in turn, and comparing actual values with the pre-determined limits, the system can pinpoint process flaws. Comparisons are made with an accuracy of 0.1 pct by digital methods. Drift, gain change, and circuit balancing problems are done away with. Also, any signal which can be converted to electricity is fair game for the new monitoring system. (Control Equipment Corp.)

For more data circle No. 34 on postcard, p. 77

Drops Dressing Costs

With a new wheel dresser, operating skill and accuracy are designed into the tool itself. It's precision en-

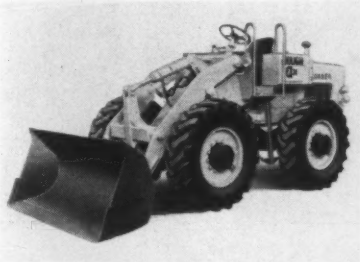


gineered to obtain 0.000025-in. size control and angular plunge forming from 0.010-0.375 in. diam. Also of interest is the fact that you never need to remove the workpiece from its magnetic chuck during the grinding operation. It doesn't matter how many times the wheel must be dressed and redressed. This is so because the dresser mounts on the surface grinder's quill. Thus, there's always perfect alignment of the dresser and the wheel; and perfect alignment between wheel and workpiece. (Crystal Lake Engineering Co.)

For more data circle No. 35 on postcard, p. 77

Tractor-Shovel Unit

Althougth it's the smallest unit in a four-wheel drive line, a combination tractor and shovel swings a 1¼-cu yd bucket. This is a 25-pct increase in capacity. Nevertheless, the new model still retains the excep-



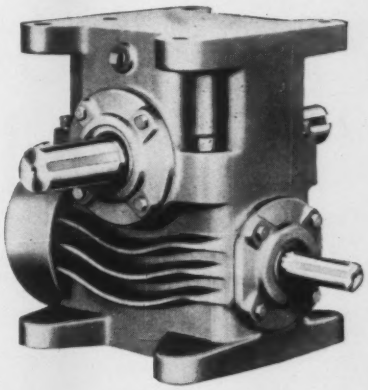
tional balance and stability of the original. For safety, boom arms are positioned ahead of, and away from, the operator. And the steeply-sloped cowl of the control cab is free of obstructions. Thus, there's excellent visibility. In addition, the loader's four-wheel hydraulic brakes provide equal braking force in both forward and reverse. Sealing out dust and dirt safeguards their operation. Dual brake pedals give the operator a choice of braking with or without transmission engagement. Torque proportioning differentials are standard on both axles. When one wheel gets more tractive effort than the other, it automatically receives up to 38 pct more torque. (The Frank G. Hough Co.)

For more data circle No. 36 on postcard, p. 77

Milling-Machine Line

Important new features in a line of vertical and universal milling machine include central controls to operate the longitudinal, transverse and vertical movements, plus power in all three directions. Every gear is hardened and ground from

A Morse answer



Eberhardt-Denver

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...when the problem involves heavy duty and reliability

High horsepower capacity
Oversize shafts
Extra-large bearings
Heavy-duty gearing
Universal mounting
All types available
Fractional to 53 hp. loads
Ratios 5:1 to 3600:1
Center distances 2″ to 7″
Distributor-stocked

Got a speed-reducer problem? Call your Morse distributor in the Yellow Pages.

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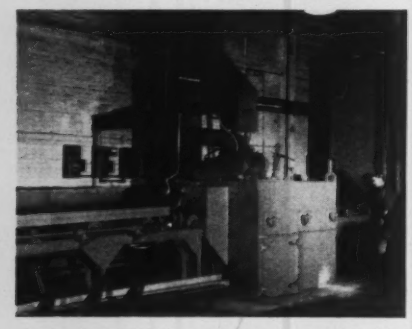
Morse Chain Co., Dept. 33-81, Ithaca, N. Y. Export Sales: Borg-Warner International, Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ont.

Wheelabrator® blast cleaning permits faster better welding of structural steel

A demonstration of WHEELABRATOR'S

VITAL VALUES

Wheelabrator airless blast cleaning makes possible more positive, lower cost welding of steel angles into a square tube for a prominent farm equipment manufacturer. When manual wire brushing was used for cleaning the angles, a preliminary welding pass was required to burn out foreign matter and oxides. With Wheelabrator blasting cleaning providing a thoroughly cleaned surface, the joint weld can be applied to both sides on the first pass with approx. 50% penetration at each joint. Better, faster welding is just one of the many benefits obtained by cleaning structural steel to "white metal" with the Wheelabrator prior to fabricating. Write today for the complete story on the savings potential with the Wheelabrator.



Faster, better welds are obtained on steel angles as a result of the thoroughly cleaned surface provided by Wheelabrator blast cleaning.

VITAL VALUES FOR INDUSTRY

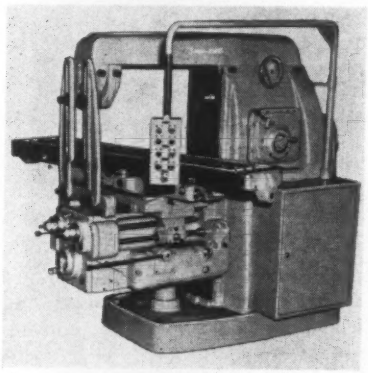
WHEELABRATOR

AIRLESS BLAST EQUIPMENT

WHEELABRATOR CORPORATION, 510 S. Byrkit St., Mishawaka, Indiana. In Canada, WHEELABRATOR CORPORATION OF CANADA, LTD. 1901 Birchmount Rd. P.O. Box 490, Scarborough, Ontario

A subsidiary of Bell Intercontinental Corp.

nickel-chromed steel. Tapered and/or ball bearings support them. In addition, all castings are of a close-grained gray iron. To reduce friction and wear, an automatic system lubricates the column, saddle, table

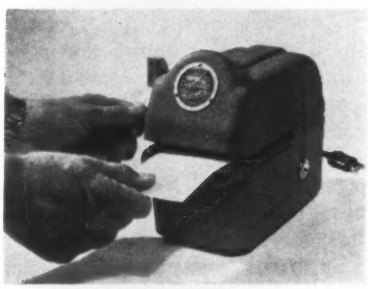


and knee. Electric clutches and electro-magnetic brakes are also standard equipment. Spindle speeds range up to 1520 rpm. Dial controls select both speeds and feeds. (S & S Machinery Co.)

For more data circle No. 37 on postcard, p. 77

Computes Job Time

A new time recorder automatically computes and prints out the individual time worked by an employee on a particular job. When it's used in job-time payroll systems, employee's time cards are ready for auditing and processing. Thus, arithmetical job-time determinations are eliminated. In operation, an em-

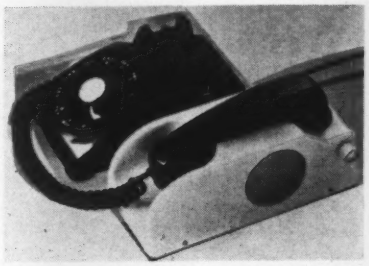


ployee inserts a standard time card and pushes a lever. This imprints a circle with eight hours marked in tenths around the rim of the circle. When the job is finished, the card is inserted again. Pushing the "out" side of the time recorder imprints the amount of time worked. The time computer is specifically designed for plants keeping daily cost records by job and employee. (Cincinnati Time Recorder Co.)

For more data circle No. 38 on postcard, p. 77

Holds The Line

Want both hands free during your telephone conversations? It certainly beats phone juggling. With a new, transistorized, telephone holder, busy executives can relinquish the telephone to make notes, open desk drawers etc., and still carry on the conversation. For group discussions, a volume control knob regulates loudness. In fact,

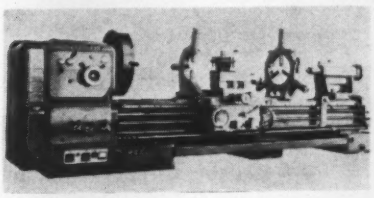


depending on the loudness setting, you can talk into the holder from a distance up to 10 or 12 ft. Small and portable, the holder comes ready for use. There's nothing to plug in or install since four ordinary flashlight batteries give up to 500 hours of use. (Bell Industries of California)

For more data circle No. 39 on postcard, p. 77

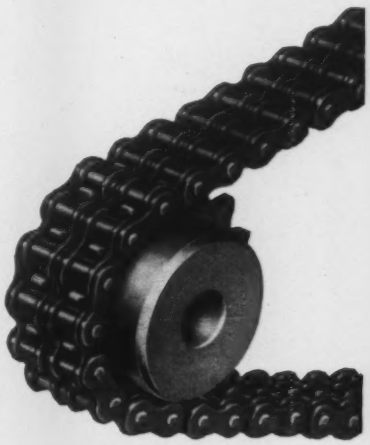
Long Line of Lathes

New additions to a line of engine lathes bring the number of models to a total of nine. The new sizes have a swing of 31, 37 and 41 in. over the bed. They're available with center distances ranging from 40 up to 240 in. With these additions, sizes in the line now include from



14-241 in. swing, with 4-25 hp. All feature ground and hardened gears, a three-bearing spindle that mounts on double-taper roller bearings, and

A Morse answer



roller chain

...when the problem involves service life and performance

Superior fatigue resistance

Increased horsepower ratings

Statistical hardness control

Electronically controlled pitch

All parts automatically inspected

Drive-design service

Distributor-stocked

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to .0025
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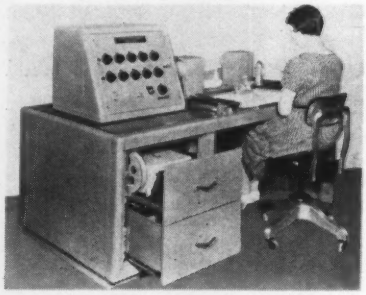
Pure tin and tin-lead alloys are now coated on copper, brass, or nickel in all gauges from .002 to .012 in thicknesses of .00002 to .0025.
Over 50 years experience in the highly specialized field of thin strip makes Somers your #1 source for that one job in ten that must meet rigid specifications. Write for confidential data blank to get the exact thin strip for your requirements — no obligation, of course.
SOMERS BRASS COMPANY, INC. • 94 Baldwin Ave., Waterbury, Conn.

spindle control by hydraulic clutch and brake. A totally-enclosed, quick-change gear box, large-capacity gap piece, automatic lubrication for the headstock, and hardened and ground bedways are other bonus features. (Hermes Machine Tool Co., Inc.)

For more data circle No. 40 on postcard, p. 77

Programs from Art

An independent programmer prepares conventional 1-in. wide, 8-channel tapes for drilling printed-circuit boards directly from art work. According to the manufacturer, it's a high-speed, highly-accurate unit which can be used with any conventional tape-controlled, printed-circuit driller. The machine lets the operator work quickly and accurately, locating up to 30 positions per minute directly from the art work. This does away with the expensive, time-consuming job of dimensioning coordinate positions and preparing special templates or master boards. Since the programmer is independent of the drilling equipment, it prepares tapes while the machine is drilling printed-circuit boards. Naturally, this saves time and boosts efficiency. (Edlund Machinery Co.)

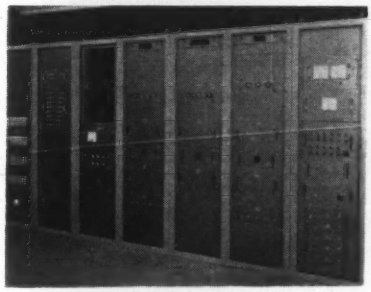


For more data circle No. 41 on postcard, p. 77

Control System

A new system controls a 56-in. reversing rougher at a semi-continuous, hot-strip mill. The system will automatically start, stop, reverse and position slabs. It also sets the roll openings on the reversing mill (roll positioning to ± 0.001 in.), roughing scalebreakers and vertical

edgers. The system will operate sideguards and provide digital information to a data processor for production monitoring. In addition,

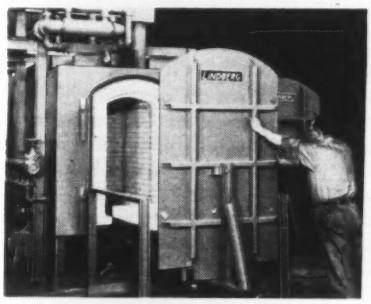


it automatically provides draft compensation of vertical-edger and control-table speeds. (Datex Corp.)

For more data circle No. 42 on postcard, p. 77

Car-Bottom Kiln

Here's a car-bottom, electrically-heated, periodic kiln for diversified uses such as the development and production of ferrites and other electrical ceramics, refractories, grinding wheels and porcelains. Operation of the kiln is fully automatic. The preset cycle can be changed or altered at any time, either in the firing or in the cooling, even after the cycle has started. The new kiln also maintains a uniform temperature automatically. Since the rate of temperature rise and the quench cycle are variable at any time, the kiln permits effective use of closely-con-



trolled, protective atmospheres. The unit's working chamber is 21 x 60 x 36 in. Gross load is 1600 lb. It can be cooled from 2500°F to 200°F in 8 hours. (Kiln Div., Lindberg Engineering Co.)

For more data circle No. 43 on postcard, p. 77

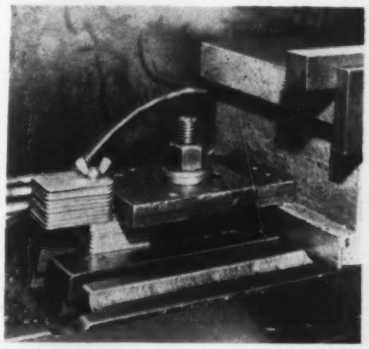
Controls Torque

With a unique hydraulic amplifier, a new air-impact wrench shuts off when the desired torque level is reached. The torque-sensing device is an integral part of the driving spindle. It has quick, easy, adjustment for a range of 20-100 ft lb. The adjustment is tamper-proof. Rated at ⅜-in. nominal bolt size, the wrench is also reversible. Ideal uses include tightening door-hanging and cylinder-head bolts in the automobile industry, and attaching end plates, flanges, etc., on pressure vessels. Of course, it will also handle innumerable other assembly jobs where specified torques must be maintained. (The Rotor Tool Co.)

For more data circle No. 44 on postcard, p. 77

Speeds Setups

Among the advantages claimed for a new step block are a 50 pct



decrease in setup time plus uniform heights and quick adjustment. Typical uses are holding fixtures for high-speed tapping or grinding on a drill press or surface grinder. The blocks are made of cold-rolled steel that's zinc plated to prevent rust. Solvents and oils cause no deterioration. The blocks are a convenient and compact device for the machinist who demands dependable leveling. (HEF Co.)

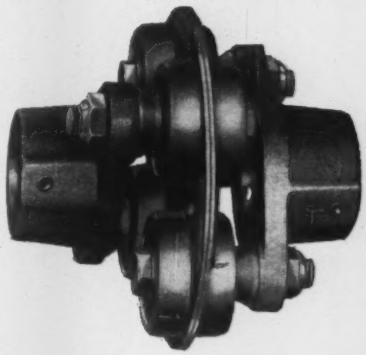
For more data circle No. 45 on postcard, p. 77

Sonic Gun

Instantaneous ultrasonic defoaming, degassing, mixing and dispersing in pipe lines or tanks is now possible with an unusual sonic gun. The gun also serves as a high-level noise source for signaling or environmental testing. (Ultrasonics Industries, Inc.)

For more data circle No. 46 on postcard, p. 77

A Morse answer



Morflex couplings

...when the problem involves vibration and misalignment

Isolate vibration

Cushion shock

Absorb misalignment

Torsionally flexible

Impervious to water, dirt, oil

Arrest electrolysis

Distributor-stocked

Got a coupling problem? Call your Morse distributor. He's listed in the Yellow Pages.

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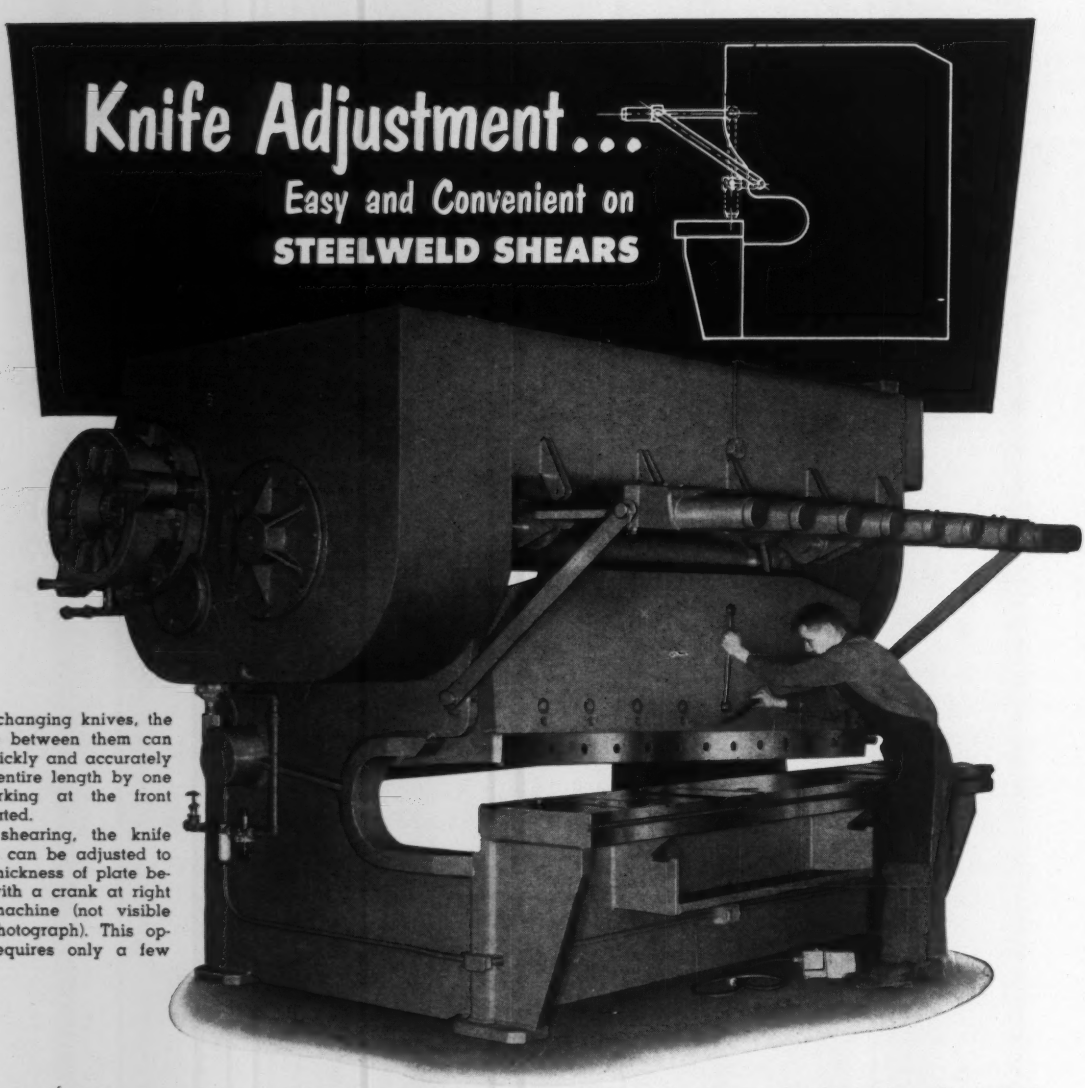
Knife Adjustment...

Easy and Convenient on STEELWELD SHEARS



When changing knives, the clearance between them can be set quickly and accurately for their entire length by one man working at the front as illustrated.

When shearing, the knife clearance can be adjusted to suit the thickness of plate being cut with a crank at right end of machine (not visible in this photograph). This operation requires only a few seconds.

When the knives on a Steelweld Shear are being set parallel from one end to the other, it is not necessary to have one man at the rear of the machine turning adjustment bolts, with another man at the front gauging the knife clearance. Nor is it necessary to work between or behind the hold-downs in hard-to-reach places.

On Steelwelds the hold-down beam can be lifted out of the way and all knife adjustment bolts reached from the front of the machine. As each bolt is turned, the clearance can be checked at once. One man can make the entire adjustment in a small fraction of the time usually required.

After the knives have been set for parallel, the clearance between them can be adjusted to suit various plate thicknesses to obtain the best possible cuts. This can be done in a few seconds by turning a crank and watching a dial indicator.

Because knife adjustments have been made so convenient on Steelwelds, shear operators will make them gladly and without hesitation. This contributes greatly to accuracy and quality of cuts and assures long knife life.

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CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

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STEELWELD PIVOTED BLADE SHEARS

Steel Market Set to Explode

All the potential factors of a steel explosion are present in the early fall steel market.

Both real and psychological pressures will bring about longer deliveries and some shortages.

■ Pressures for an explosion of the steel market are building up. The mounting potential will lengthen steel delivery promises in the early fall and threatens to create a short-term steel shortage.

These are the important factors in the potential market buildup:

1. Inventories of steel are low and too many large users are relying on fast delivery. Inventories must be rebuilt to sustain even current rates of manufacturing.

2. Berlin and other international problems are creating pressures, both real and psychological. Users are afraid of controls and do not want to get caught short in case of a national emergency. At the same time, the defense buildup will add a moderate bulge to tonnage needs.

3. The general economy is rising at a faster rate than expected. The record rate of industrial production in July was reached with little step-up in steel orders. When users try to build up steel stocks in a period of increasing rate of consumption, effects on the market multiply.

4. Some instances of price hedging against a possible increase in steel costs after Oct. 1 are on record.

5. Auto companies, which have been cautious as labor contract deadlines approach, will have to come into the market for much larger tonnages than now on the books. Users know from experience that automakers get priority when they demand large tonnages for a given date.

Buying Later—Automakers have notified steel companies the bulge is likely to come in September and they expect to get what they want when they want it.

Auto parts makers, who got the word early, have already stepped up their production and steel buying, to be ready for the upsurge in auto assemblies after the labor trouble is cleared away.

Hidden Pressures—Most of these pressures are still below the surface and have not yet made a strong impact on sales offices. But there has been a general improvement of orders on a broad base in the past 10 days, with elements all in place for a first-class upsurge.

In the Midwest, major mills, sensing the situation, expect a six weeks extension on delivery dates for flat-rolled products by October; some say even sooner.

Higher Rates — At the present time, orders are coming into steel mills at a rate to sustain operations at nearly 70 pct of capacity. Some mills that have a heavy percentage of business on sheets are doing better than that.

Flat-rolled products, as is the usual case, lead the upturn, even before the influx of automotive orders. Galvanized and tinplate have been strong through the year. Warehouses, which did not build inventories during the summer as improved business countered slightly better mill orders, are now building stocks.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	114	107	96	92
Buffalo	90	86	84	86
Pittsburgh	90	94	88	71
Youngstown	96	94	89	77
Cleveland	109	104	102	85
Detroit	128	119	117	113
Chicago	106	105	107	87
Cincinnati	109	120	117	79
St. Louis	115	107	107	86
Southern	110	105	103	88
Western	115	108	117	77
U. S. Index	104.4	102.5	99.7	83.6

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons,000 Omitted)	1,944	1,910	58,090	70,755
Ingot Index				
(1957-59=100)	104.4	102.5	94.5	115.1
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.41
Scrap No. 1 hvy (Gross ton)	$37.83	$37.83	$36.67	$32.50
No. 2 bundles	$24.50	$24.50	$24.17	$22.17

Vendor Rating Aids Offered

Vendor evaluation expert offers suggestions to PA's on setting up a plan.

But he emphasizes that no supplier rating plan supplants PA's experience and judgment.

■ Every day, PA's award purchase orders to vendors who are not low bidders. And this happens most often where the buyers are perhaps the most alert and competent.

This is no puzzle to experienced buyers. They know that price buying, as such, is nothing more than a clerical function. And there is less and less room for clerks in purchasing. Buyers doing a real service for their companies rate vendor bids on the basis of total cost. They weigh the elements of price, quality, delivery and service.

Probably no one has been closer to the subject of vendor evaluation in the last year than D. V. Smith. Mr. Smith is chairman of the committee on Standards for Vendor Evaluation of the National Assn. of Purchasing Agents. He is also a purchasing service specialist with the General Electric Co.

New Booklet—The committee, headed by Mr. Smith, is expected shortly to issue a booklet through the NAPA on vendor evaluation.

Mr. Smith can't, of course, reveal the specific program for vendor evaluation developed by his committee for the forthcoming NAPA booklet. But in an IRON AGE interview he did offer some counsel and information to purchasing men wrestling with the problem of rating their suppliers.

"Most supplier rating programs," he says, "are just plain unwieldly. Consequently, they are never used."

Mr. Smith sets three criteria for any vendor rating plan: It should be simple in construction; it should require only a nominal amount of data; and it should permit quantitive measurement.

Another point he stresses: Don't rely on any plan to temper the need for "judgment and common sense." There is no "automatic" program. There is a large element of human relations in vendor dealing. And PA's must remain flexible and draw on their experience for many important decisions.

Judgment Needed—The plan that Mr. Smith and his committee will propose to the NAPA membership attaches a dollar-and-cents value to the main factors in purchasing decisions—price, quality, delivery and service. But it still calls for judgment in execution.

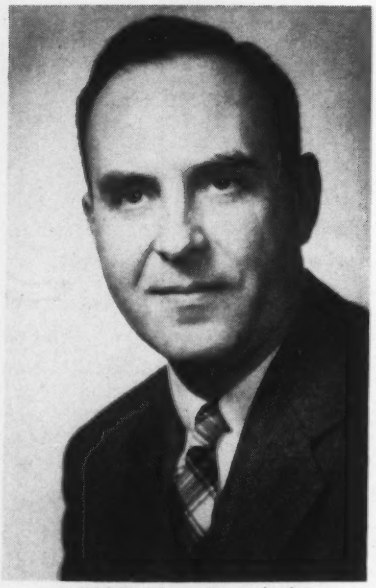
By including all the above elements in a vendor rating plan, a PA will be able to award orders on the basis of "total economical cost—not just price."

"In the matter of price," says Mr. Smith, "there should be considered unit price, discount, freight, insurance and taxes. Price should be viewed as a total acquisition cost."

And he points out that quality measurements entail more than direct costs of rejections. "Lab and inspection tests are measurable costs," he says. "And field failures experienced by customers due to product defects must be weighed."

Pin-Point Costs — Delivery, in Mr. Smith's view, goes beyond shipping costs. For example, he stresses the need to accurately assign expediting costs to each vendor. Calls and telegrams, visits to supplier plants, and premium transportation charges due to missed delivery dates can mount to sizable costs, he reminds.

The most difficult area to measure, admits Mr. Smith, is service. But assigned weights to vendor service factors based on needs of the PA's company can take much guesswork out of this element. For example, a small company with a technical product but a limited technical staff may rate a vendor high on the basis of its technical staff size and ability.



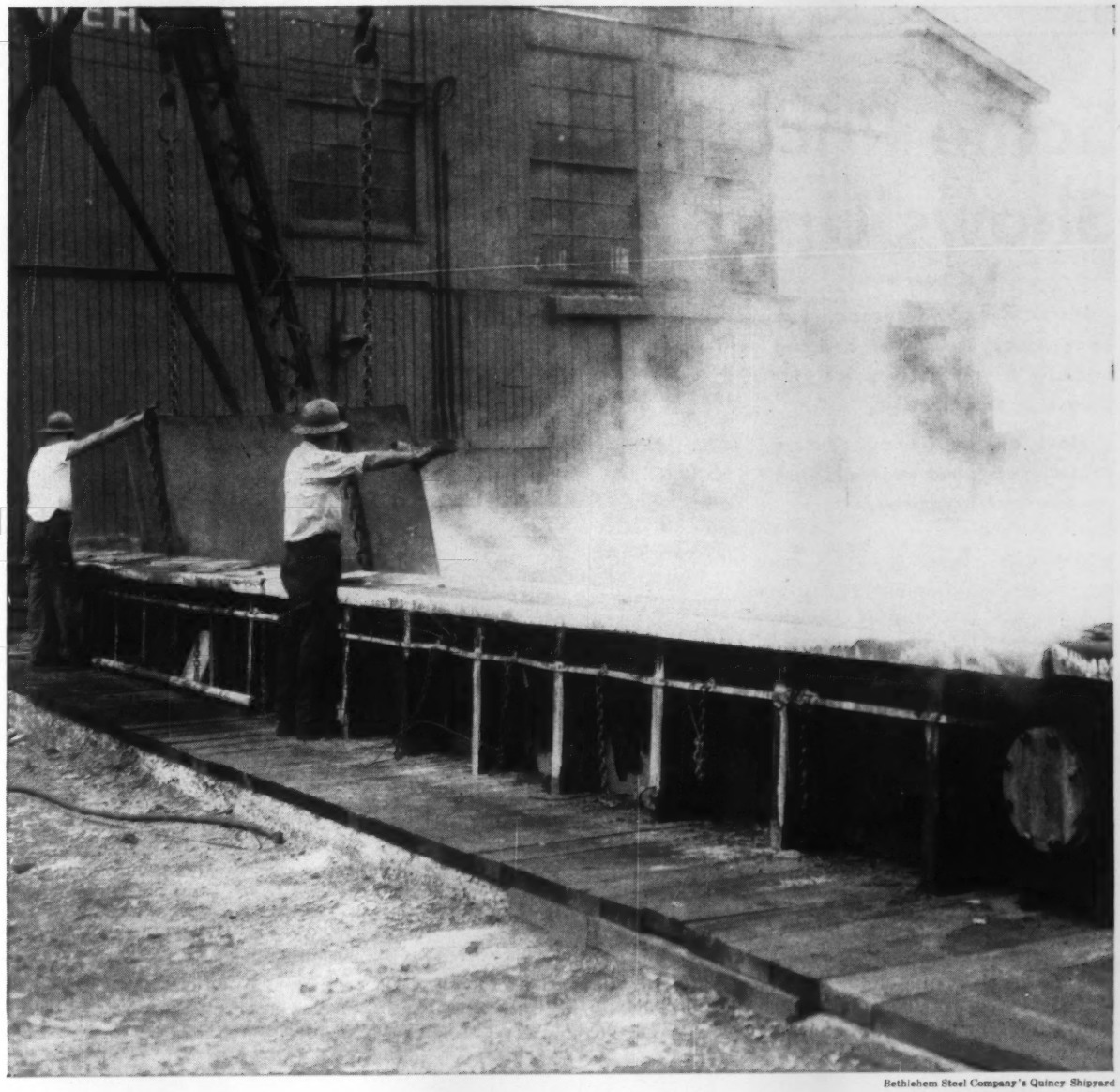
SMITH: Use plan wisely.

Other Factors—Other important service factors identified by Mr. Smith include production capacity and potential, willingness to accept risks and alert communications on order progress.

Mr. Smith also suggests that any program have provisions to evaluate new, untried vendors and single suppliers. In the case of new vendors, he says, "The reporting cycle of information should be set up under a priority system."

Single Suppliers—In rating single suppliers, comparisons of the buying factors must be made against vendors shipping similar parts or materials.

According to Mr. Smith and other experts, vendor evaluation offers purchasing one of its best moves forward in professional development. And it is getting to be a competitive necessity.



Bethlehem Steel Company's Quincy Shipyard

Hot acid meets its match

THAT'S armor plate, soon to be part of a new ship, being plunged into a 26-year-old tank of hot acid. This job of pickling steel used to be dangerous and costly because the only tanks that could hold the acid without corrosion were masonry or wood. And they leaked.

A leakproof tank seemed impossible until B.F.Goodrich engineers came up with a protective lining for metal tanks. The B.F.Goodrich Triflex lining is a combination of hard rubber sandwiched between soft rubber that stands the most corrosive acids. The lining is permanently bonded to the steel tank. And for this job, it was protected from excessive heat and accidental gouges by a sheathing of brick.

The 42-foot tank shown above was lined by this method in 1935. Since then it's been in almost constant use, except for some downtime in 1947.

Good as this service life is, we don't claim it's a record-breaker. Some tanks lined by B.F.Goodrich 37 years ago are still in use today. Many have lasted 20 to 30 years. Not one has ever failed to put an end to costly leaks, high maintenance costs, danger to workmen. If you'd like more information about BFG's abilities and facilities for rubber lining, write *B.F.Goodrich Industrial Products Co., Dept. M-170, Akron 18, Ohio.*

B.F.Goodrich

TANK LININGS

Some Price Hedging Shows Up

It's not yet widespread. But some steel users are hedging against a possible price increase in October.

Most of the buying centers around flat-rolled products, but wire is also mentioned.

■ Although it's not general, some steel users are hedging against a possible steel price rise in October.

Right now the policy is centered mainly in sheet buying. But a few wire products buyers are also doing some hedging.

An East Coast sheet producer reports buyers are moving tonnages from October into September. They are specifying that delivery must be made before October 1, the date steel wage rates rise. And they make no bones about a steel price rise being behind their actions.

Varied Influences—As yet, such hedging is limited. Other factors are influencing the order situation in flat-rolled. Auto plants have reserved tonnages for September and October. But orders are placed with the understanding October shipments can be deferred in the event of an auto strike.

Warehouses, which had better summer sales than expected, are building up flat-rolled stocks to a degree. But if the auto industry avoids a strike, auto steel demands will increase heavily next month. This could wipe out the present, small warehouse inventory buildup quickly. Because of this, the service centers are not hesitating about increasing flat-rolled stocks now.

New Thin Tinplate—U. S. Steel Corp. has confirmed production of its new "lighter, thinner" grade of Ferrolite 10. (See IA, Aug. 17, p. 71.) The new thin tinplate, priced 15¢ a base box lower in all basis weights than present Ferrolite, has a coating of one-tenth pound of tin per base box. Formerly, Ferrolite was produced in only one grade, with a quarter-pound of tin coating per base box.

Weirton Steel Co. division of National Steel Corp. has also begun selling the new product.

Regarding thin tinplate generally, U.S. Steel says, "Even lighter basis weights than those now available appear likely in the foreseeable future."

In the tinplate market, mill shipments are holding up well. After a second quarter lag, releases are coming through in the third quarter and show no signs of tapering off. However, there's still no word on the fourth quarter plans of canmakers.

Sheet and Strip—Coated-sheet deliveries are stretching out. For aluminized steel, where capacity is limited, producers are into November. And a **Philadelphia** report indicates that some sizes are booked for the rest of the year. Galvanized has moved into the last half of September, and in some cases it is early October. A similar report comes from **Cleveland.** It notes that, despite all of new capacity available, promises stretch out to October for delivery.

Wire—Output of wire products is running at about 55 pct of recent capacity. And producers are looking for a 5-point increase in September, according to reports from **Cleveland.** Some automotive parts suppliers and furniture makers are stocking up. Defense-type orders are also on the increase. But fasteners continue slow.

Summer construction business never really pushed producers anywhere near capacity. This has been due in part to financial problems arising from slowness of payments from Federal and local governments.

Imports, too, have had an impact on wire. Many products still sell for about 15-20 pct under domestic prices. In the first five months of 1961, imported barbed wire took 48 pct of the market. Imported rebars got 17 pct, wire rods grabbed 24 pct, and nails and staples were at 40 pct.

Pipe and Tubing—Oil country seamless remains at a depressed level, says a **Pittsburgh** mill. It sees no indications of an early improvement. Large diameter pipe production is spotty. It centers mainly on routine buying by utilities. A **Cleveland** report says most surburban feeder lines have been built, so this phase is at a plateau for the time being.

Plates and Shapes — August is shaping up as the best month of the year so far for plates and structurals. There has not been a sharp upturn anywhere along the line. But there have been steady gains almost since the beginning of the year. **Pittsburgh** mills say heavy plates are the strongest of the heavy steels at the moment. Wide flange beams come next. **Philadelphia** reports say, however, that customers are still trying for fast delivery.

But even there deliveries for several major mills have moved out about a week. Other mills report a firming market.

PURCHASING AGENT'S CHECKLIST

Continuous casting process has many attractions. P. 38

"Forced" thinking speeds new product flow from idea to drawing board. P. 43

New broaching machines show versatility of the process. P. 51

COMPARISON OF PRICES

(Effective Aug. 21, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Aug. 21 1961	Aug. 14 1961	July 24 1961	Aug. 23 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.49¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Aug. 21 1961	Aug. 14 1961	July 24 1961	Aug. 23 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.57
Foundry, South Cin'ti.	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	70.11	70.07
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. cents per lb‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.44	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$35.50	$35.50	$35.50	$31.50
No. 1 steel, Phila. area	39.50	39.50	38.50	34.50
No. 1 steel, Chicago	38.50	38.50	36.00	31.50
No. 1 bundles, Detroit	35.50	35.50	35.50	29.50
Low phos., Youngstown	41.50	41.50	40.50	37.00
No. 1 mach'y cast. Pittsburgh	45.50	45.50	45.50	47.50
No. 1 mach'y cast. Phila.	49.50	49.50	49.50	49.50
No. 1 Mach'y cast. Chicago	49.50*	48.50	47.50	47.00
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$37.83	$37.83	$36.67	$32.50
No. 2 bundles	24.50	24.50	24.17	22.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	$31.00	$31.00	$31.00	$33.00
Copper, Lake, Conn.	31.00	31.00	31.00	33.00
Tin, Straits, N. Y.	119.00†	118.625**	115.50	101.625
Zinc, East St. Louis	11.50	11.50	11.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	26.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Larado, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strip.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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*Appears in the Aug. 17-Aug. 31 issues.

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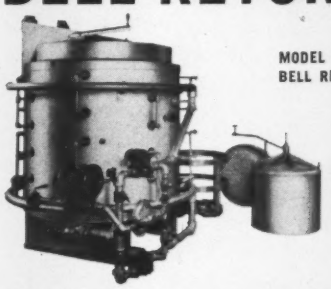

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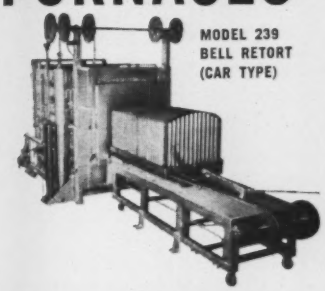

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Scrapmen Expect September Gains

Most dealers and brokers look for a general upswing in the scrap market by September.

They say a gain in mill operations and a tightening supply will hold the key.

■ The scrap market remains firm and apparently poised for an upward movement. According to most dealers and brokers, the general upswing in the market should come in September.

But the market, for now, remains virtually unchanged. Steelmaking grades in Cincinnati climbed $2 this week. This follows similar gains in Chicago and Cleveland in recent weeks. There is also the chance prices may climb in Pittsburgh soon. Dealers there are resisting present offers. If mills want the scrap bad enough they will have to pay more money for it.

Worth noting is the report that Japanese buyers are now on the West Coast with price and market feelers. Most indications call for reduced demand from the Japanese during the fourth quarter. This could have a significant bearing on the overall market.

(Hamilton, Ont., prices are always based on **net** tons; Houston prices on **gross** tons. In the Aug. 10 and 17 issues, these designations were transposed.)

Pittsburgh — A better feeling among dealers has tightened the scrap supply. With reports of rising mill operations, yards are refusing to sell at prices that were producing shipments earlier in the month. One local consumer is finding no takers on a price of $23 for No. 2 bundles. There is also resistance to a price of $27 for bundles going to a nearby district. There has not been time for mill purchases to indicate how much more money will be needed to satisfy the current limited demand. And there is no indication the largest buyers are ready to come into the market with tonnage orders.

Chicago — The dealer market continues to tighten on scattered new mill and foundry sales. There are also reports that exporters are again making inquiries. While the market had been expected to take a breather, there are no evidences of weakening. A strengthening steel outlook also appears to be affecting dealer willingness to hold scrap. This, again, forces broker buying prices up.

Philadelphia — Prices are unchanged, but the market remains firm. Though export is still the backbone of this market, many area dealers and brokers say domestic interest is increasing. If local mills start buying any large tonnage soon, prices will have to climb. In fact, some scrapmen look for such gains in September.

New York—The market is still slow domestically. Export activity remains the only real source of demand for area dealers. However, most scrapmen look for a pickup soon as mill interest increases. There are no changes in prices.

Detroit—A stronger market is expected next month. There is little activity now. But there is some buying of No. 2 bundles, foundry steel and a clearing up of export orders. The undertone of stronger prices comes from an anticipation of better mill demand in September. Auto labor talks lend a speculative note to next month's activity.

Cleveland—Dealers and brokers are still bullish and any new mill orders would probably be at slightly higher prices. Bidding on auto lists will be a problem because of strike possibilities in the auto industry. Tonnage should be up without a strike. If there is a strike, dealer scrap would be somewhat more valuable.

Cincinnati—Market is up $2 on steelmaking grades as bullish dealers refuse to sell for less. Brokers now have to pay more than the mill price to cover. Although one area mill is out of the market for a time, other area and upriver markets are building up scrap.

St. Louis — Dealers report a stronger tone to the market. But, so far, mills haven't done much to support this feeling. Very little scrap is moving. Dealers aren't anxious to sell, however. It looks like it will take more money to start scrap moving again.

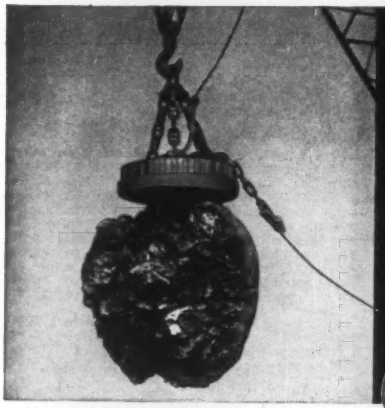
Birmingham—The domestic market is firm and fairly active. Pipe manufacturers are buying two-ft electric furnace steel at $38. Some consumers are reportedly making special tonnage deals at higher prices and paying more for outside scrap than they offer local dealers.

Buffalo — Market continues firm as the result of pressure from outside markets. However, demand for scrap is not strong enough yet to force a price upturn.

Boston—There is no change in this market for the second straight week. But dealers say they are getting ready for some activity.

West Coast—The trade looks for good-sized September commitments from the major mills. Exporting is still the sustaining force.

Houston—Trading is at a low ebb. But the next few weeks are expected to bring additional export.



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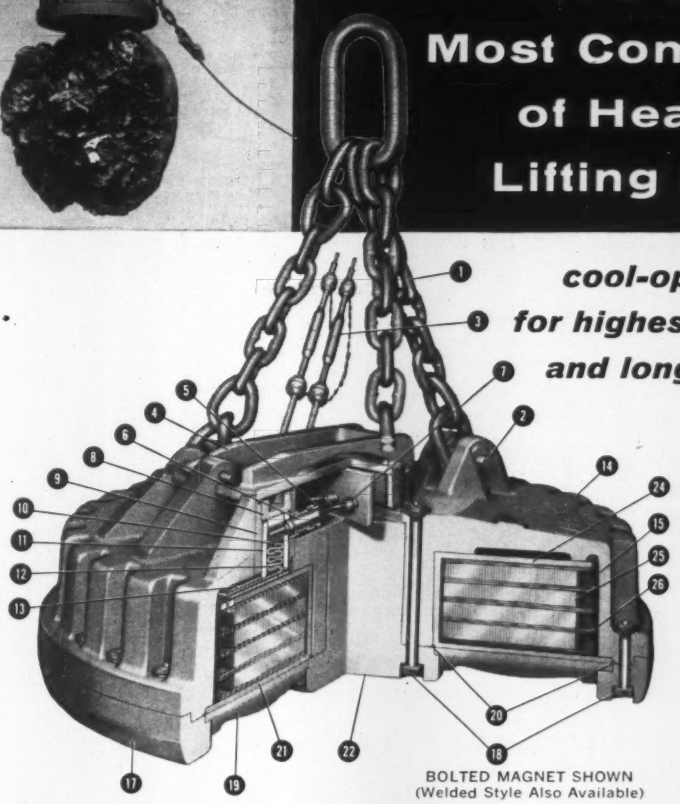

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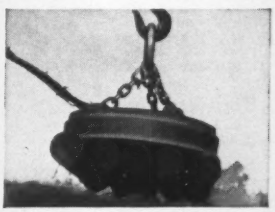

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STEARNS MAGNETIC PRODUCTS
635 South 28th Street • **Milwaukee 46, Wisconsin**
Phone EVergreen 3-4800 ***Direct Distance Dialing Code 414***

Profit with Stearns — First with Ceramic Magnet Separators for Industry

SCRAP PRICES *(Effective Aug. 21, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. punch'gs plate	43.00 to 44.00
Heavy turnings	30.00 to 31.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 47.00
Rails 2 ft and under	51.00 to 52.00
RR specialties	46.00 to 47.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	85.00 to 90.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$38.00 to $39.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	39.00 to 40.00
No. 1 factory bundles	44.00 to 45.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Low phos. forge crops	48.00 to 49.00
Low phos. punch'gs plate, ¼ in. and heavier	46.00 to 47.00
Low phos. 2 ft and under	44.00 to 45.00
No. 1 RR hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	48.00 to 49.00
Rerolling rails	60.00 to 62.00
Rails 2 ft and under	51.00 to 52.00
Angles and splice bars	46.00 to 47.00
RR steel car axles	60.00 to 61.00
RR couplers and knuckles	46.00 to 47.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	43.00 to 44.00
Cast iron wheels	35.00 to 36.00
Malleable	48.00 to 49.00
Stove plate	38.00 to 39.00
Steel car wheels	46.00 to 47.00
Stainless	
18-8 bundles and solids	190.00 to 195.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	95.00 to 100.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	42.00 to 43.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	13.00 to 14.00
Mixed bor. short turn.	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	29.00 to 30.00
Low phos. 5 ft and under	43.00 to 44.00
Low phos. 2 ft punch'gs	45.00 to 46.00
Elec. furnace bundles	43.00 to 44.00
Heavy turnings	27.00 to 28.00
RR specialties	44.00 to 45.00
Rails, 18 in. and under	52.00 to 54.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	39.00 to 40.00
Cast iron car wheels	42.00 to 43.00
Malleable	48.00 to 49.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Low phos. 18 in. and under	42.00 to 43.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	47.00 to 48.00
No. 1 cupola cast.	33.00 to 34.00
Heavy breakable cast.	30.00 to 31.00
Drop broken cast.	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Low phos. plate	41.00 to 42.00

Cleveland

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	36.50 to 37.50
No. 1 factory bundles	42.00 to 43.00
No. 2 bundles	22.50 to 23.50
No. 1 busheling	36.50 to 37.50
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Cut structural & plates, 2 ft & under	41.00 to 42.00
Low phos. punch'gs plate	37.50 to 38.50
Drop forge flashings	35.50 to 36.50
Foundry steel, 2 ft & under	34.00 to 35.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	52.00 to 53.00
Steel axle turnings	27.00 to 28.00
Railroad cast.	48.00 to 49.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	39.00 to 40.00
Malleable	51.00 to 52.00
Stainless	
18-8 bundles	175.00 to 180.00
18-8 turnings	100.00 to 105.00
430 bundles	80.00 to 85.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Cast iron borings	15.00 to 16.00
Low phos. plate	37.00 to 38.00
Structurals and plate, 2 ft and under	39.00 to 40.00
Rails 2 ft and under	48.00 to 49.00
Scrap rails, random lgth.	38.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	29.00 to 30.00
Foundry steel, 2 ft	31.00 to 32.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	13.50 to 14.50
Shoveling turnings	15.50 to 16.50
Cast iron borings	24.00 to 25.00
No. 1 RR hvy. meltings	37.00 to 38.00
Rails, random lengths	40.00 to 41.00
Rails, 18 in. and under	44.00 to 45.00
RR specialties	42.00 to 43.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	32.00 to 33.00
Stove plate	32.00 to 33.00
Cast iron car wheels	34.00 to 35.00
Rerolling rails	56.00 to 57.00
Unstripped motor blocks	34.00 to 35.00

Birmingham

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	18.00 to 19.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	10.00 to 11.00
Electric furnace bundles	38.00 to 39.00
Elec. furnace, 3 ft & under	36.00 to 37.00
Bar crops and plate	44.00 to 45.00
Structural and plate, 2 ft	43.00 to 44.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rail, random lgth.	42.00 to 43.00
Rails, 18 in. and under	46.00 to 47.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	42.00 to 43.00
Stove plate	42.00 to 43.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	18.00 to 19.00
Mixed bor. and turn.	5.00 to 6.00
Machine shop turnings	1.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	38.00 to 39.00
Mixed yard cast.	34.00 to 35.00
Heavy breakable cast.	32.00 to 33.00
Stainless	
1818 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	32.00 to 33.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	13.00 to 14.00
Heavy breakable cast.	28.00 to 29.00
Mixed cupola cast.	31.00 to 32.00
Automotive cast.	40.00 to 41.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	70.00 to 75.00
430 bundles and solids	70.00 to 75.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	29.00 to 30.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	3.50 to 4.00
Shoveling turnings	8.00 to 8.50
Clean cast. chem. borings	17.50 to 18.00
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	30.00 to 31.00
Heavy breakable cast.	29.00 to 29.50

San Francisco

No. 1 hvy. melting	$42.00 to $44.00
No. 2 hvy. melting	39.00 to 41.00
No. 1 dealer bundles	.... 28.00
No. 2 bundles	.... 25.00
Machine shop turn.	16.00 to 17.00
Cast iron borings	16.00 to 17.00
No. 1 cupola cast.	.... 47.00

Los Angeles

No. 1 hvy. melting	$41.00 to $43.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 dealer bundles	.... 28.00
No. 2 bundles	.... 25.00
Machine shop turn.	.... 15.00
Shoveling turnings	.... 15.00
Cast iron borings	.... 15.00
Elec. furnace 1 ft and under (foundry)	.... 50.00
No. 1 cupola cast.	46.00 to 47.00

Seattle

No. 1 hvy. melting	.... $42.00
No. 2 hvy. melting	.... 38.00
No. 2 bundles	$25.00 to 26.00
No. 1 cupola cast.	.... 36.00
Mixed yard cast.	.... 31.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

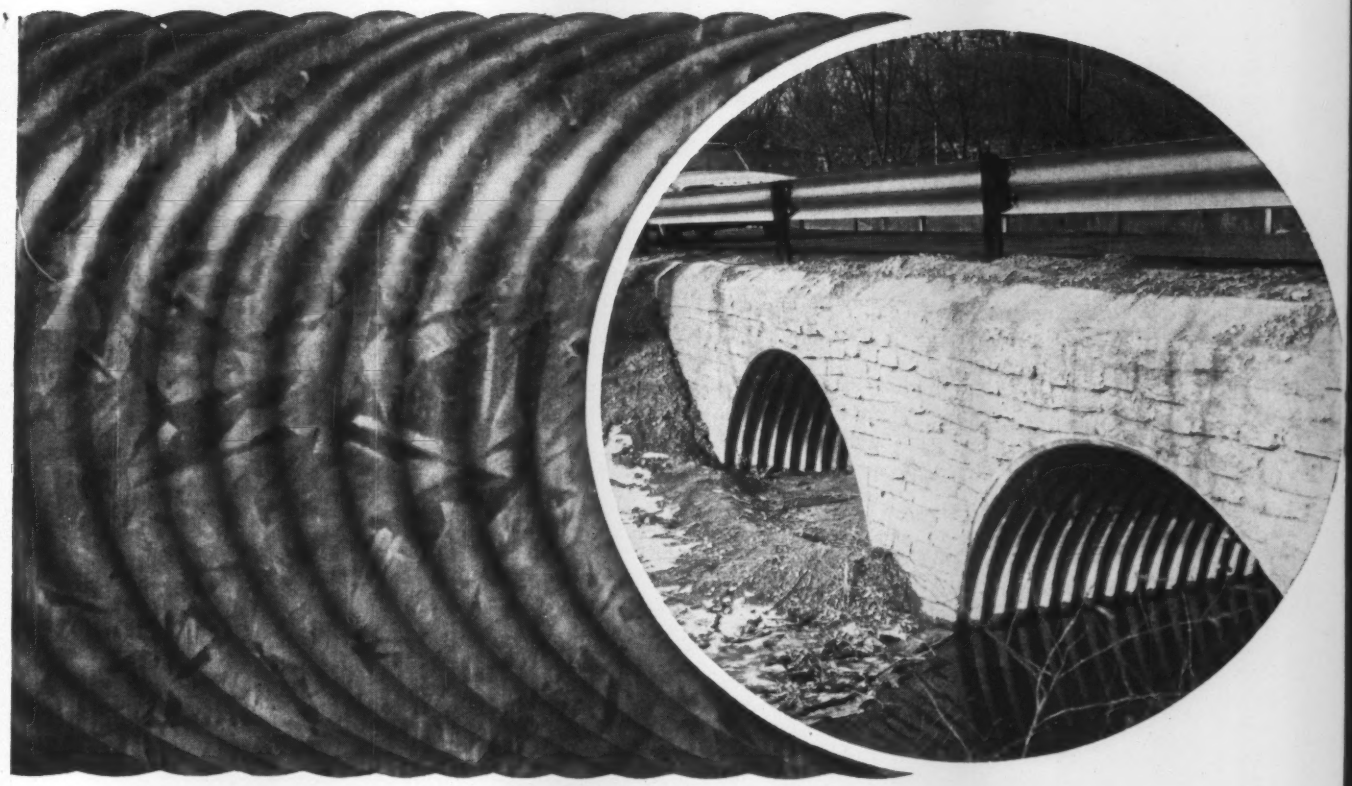
No. 1 hvy. melting	.... $31.00
No. 2 hvy. melting cut 3 ft and under	.... 28.00
No. 1 dealer bundles	.... 31.00
No. 2 bundles	.... 23.50
Mixed steel scrap	.... 23.00
Bush., new fact., prep'd.	.... 31.00
Bush., new fact., unprep'd.	.... 25.00
Machine shop turn.	.... 8.00
Short steel turn.	.... 12.00
Mixed bor. and turn.	.... 12.00
Cast scrap	.... 32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	.... $35.00
No. 2 hvy. melting	.... 33.00
No. 2 bundles	.... 24.00
Machine shop turn.	.... 8.00
Shoveling turnings	.... 11.00
2 ft & under	$44.00 to 45.00
Cut structural plate	
Unstripped motor blocks	28.00 to 29.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	28.00 to 29.00

Guardrails and culverts live longer . . .



GUARDED BY GALVANIZED STEEL

Wherever traffic or drainage flows, you'll find modern galvanized steel at work. In guardrails, for example, where nothing quite matches galvanized steel: the strength of the steel for impact; the coating of zinc for durability and ease of maintenance; the economy of the combination. And in culvert pipes, where the exceptionally high strength-weight ratio of this zinc-coated metal brings cost per year down to the barest minimum.

WEIRKOTE® IN PARTICULAR—You gain when you specify long-life galvanized steel for guardrail and culvert installations. And you gain even more when you specify National Steel's Weirkote. To the inherent strength of steel, Weirkote adds *enduring* zinc protection. Weirkote is manufactured by two National Steel divisions, Weirton Steel and Midwest Steel. For further details, write Weirton Steel Co., Weirton, West Virginia.

MIDWEST STEEL
Portage, Indiana

WEIRTON STEEL
Weirton, West Virginia

Divisions of
NATIONAL STEEL CORPORATION

Chilean Strikes Hit Copper Market

While sales of copper and brass mill products are improving, strikes cut off Chilean copper supplies.

Production halt is only one aspect of troubled copper situation in Chile.

■ Impact of the Chilean copper strikes hit U. S. mills just when the industry saw its markets improving.

While this is not the first time the market has been disrupted by Chilean labor troubles, the timing is bad. All recent signs point to a better market in copper.

"A higher rate of business activity going well into the second quarter for copper mills (brass mills) signals a recovery for the copper industry," reports E. J. Talbert, chief of program and requirements branch, Copper Div. of the Business and Defense Services Administration.

"These mills traditionally lead other fabricating groups of the industry in moving out of recessionary periods."

Stronger Demand—Earnings reports of copper companies also noted an improved demand for brass mill products in the second quarter. Deliveries of refined copper to fabricators reached their peak for the year when 139,700 tons were shipped in June. Stocks of refined copper in the U. S. were at their lowest point of the year in July at 82,800 tons.

That was the situation as the Chilean strike began. Initially, its effects on the domestic market were limited. But with the tieups cutting off 90 pct of Chile's copper output, American-owned companies there declared "force majeure" on their contracted shipments. This notified customers that an inevitable act prevented making deliveries.

Progress Slow—Efforts to settle the strike are making little headway. It began at Anaconda Co.'s mines at El Salvador and Potrerillos on August 11. Workers at Anaconda's Chuquicamata mine and Kennecott's El Teniente mine walked out in sympathy.

Chilean copper production is an important part of world output. Last year the country turned out almost 15 pct of world production. Chilean copper officials say the country holds 27 pct of the world reserves.

Other Problems — The labor troubles are only one phase of the troubled Chilean copper picture. Late in July, Enrique Serrano, Chile's Minister of Mines, revealed a plan to step up production, expand refining operations within the country, and tax copper exported without refining. This "forced" expansion plan dismayed American producers.

In addition to this, some Chileans are urging nationalization of the country's copper mining industry. While this is considered unlikely at the moment it, too, has U. S. producers worried.

Lead-Zinc Bills

Lead and zinc legislation is moving through both the House and the Senate. But the bills are different. And this difference appears likely to kill any prospect of passage during this session of Congress.

The House Interior Committee has sent to the floor a $16.5 million subsidy bill, calling for production payments to producers of less than 1500 tons of each metal the first year, 1200 tons the second year, 900 tons the third and 600 tons the fourth year.

A Senate bill has been reported favorably by a subcommittee on minerals, metals, and fuels to the full Senate Interior Committee. This bill, S.1747, is a tariff as well as a subsidy bill.

The Kennedy Administration is opposed to this bill. State Dept. spokesmen say the tariff increase would be harmful to U. S. foreign policy.

The House bill aiding zinc-lead producers is on the House floor. Committee sources expect the Senate bill will also be sent to the floor. But neither House nor Senate committeemen think either bill will get any further this year. Since Congress is expected to adjourn in mid-September, there's little time for difference in the bills to be ironed out.

Tin Prices for the Week

August 15—119.00; August 16—119.50; August 17—119.25; August 18—119.125; August 21—119.00.*

* Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colborne, Canada. **ZINC:** prime western. Other primary prices, pg. 101.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.037	.047-.060	.076-.096	.154-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	47.8
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	52.15	52.44	52.09	56.21
Brass, Rod	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Muntz Metal	51.94	.....	47.25	.....
Comm. Bz.	54.73	55.02	54.67	58.34
Mang. Bz.	57.71	61.54	51.27	.....
Phos. Bz. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod 34.77

TITANIUM

(Base 30,000 lb. f.o.b. customer's plant)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $ 5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb) ... $1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas, per troy oz. $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ..$75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. 57.00
Mercury dollars per 76-lb flask f.o.b. New York ..... $188 to $191
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz. .$24 to $26
Platinum, dollars per troy oz. .$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 91.375
Thorium, per pg $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 421 ..... 31.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95.5 aluminum-silicon alloys
- 0.30 copper max. 23.75-24.25
- 0.60 copper max. 23.50-24.00

Piston alloys (No. 132 type) ..25.00-26.00
No. 12 alum. (No. 2 grade) ..21.75-22.25
108 alloy 22.25-22.75
195 alloy 24.75-25.75
13 alloy (0.60 copper max.) ..23.50-24.00
AXS-679 (1 pct zinc) 22.00-23.00

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 23.25-24.25
Grade 2—92-95% 22.00-23.00
Grade 3—90-92% 21.00-22.00
Grade 4 — 85-90% 20.00-21.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	26¼
Yellow brass	20⅜	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19¼	18½
Free cutting rod ends	19½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 28¼
- No. 2 copper wire 26¼
- Light copper 24
- *Refining brass 25
- Copper bearing material 24

*Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

- No. 1 copper wire 28¼
- No. 2 copper wire 26¼
- Light copper 24
- No. 1 composition 24½
- No. 1 comp. turnings 24
- Hvy. yellow brass solids .... 19 —19½
- Brass pipe 18
- Radiators 20½

Aluminum

- Mixed old cast. ..... 12½—13
- Mixed new clips ..... 14½—15
- Mixed turnings, dry ..... 13 —14

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

- No. 1 copper wire ..... 24½—25
- No. 2 copper wire ..... 22½—23
- Light copper ..... 20¼—20¾
- Auto radiators (unsweated).. 16½—17
- No. 1 composition ..... 21 —21½
- No. 1 composition turnings .. 20½—21
- Cocks and faucets ..... 17 —17½
- Clean heavy yellow brass .... 14¾—15
- Brass pipe ..... 17 —17½
- New soft brass clippings .... 18¾—19¾
- No. 1 brass rod turnings .... 16½—17

Aluminum

- Alum. pistons and struts ..... 7 — 7½
- Aluminum crankcase ..... 9½—10
- 1100 (2s) aluminum clippings 11¾—12¼
- Old sheet and utensils ..... 9½—10
- Boring and turnings ..... 4½— 5
- Industrial castings ..... 10 —10½
- 2020 (24s) clippings ..... 11 —11½

Zinc

- New zinc clippings ..... 5 — 5¼
- Old zinc ..... 3 — 3¼
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1¾— 2

Nickel and Monel

- Pure nickel clippings ..... 56 —58
- Clean nickel turnings 43
- Nickel anodes ..... 56 —58
- Nickel rod ends ..... 56 —58
- New Monel clippings ..... 26 —26½
- Clean Monel turnings ..... 18½—19
- Old sheet Monel ..... 25 —25½
- Nickel silver clippings, mixed. 20
- Nickel silver turnings, mixed. 17

Lead

- Soft scrap lead ..... 7¼— 7½
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

Miscellaneous

- Block tin ..... 90 —92
- No. 1 pewter ..... 65 —67
- Auto babbitt ..... 46 —47
- Mixed common babbitt ..... 10 —10½
- Solder joints ..... 15 —15½
- Small foundry type ..... 9 — 9½
- Monotype ..... 9¼— 9¾
- Lino. and stereotype ..... 8½— 8¾
- Electrotype ..... 8 — 8¼
- Hand picked type shells .... 5¾— 6¼
- Lino. and stereo. dross ..... 1¾— 2¼
- Electro dross ..... 2½— 3

(Effective Aug. 21, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,C4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras

(Effective Aug. 21, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes▲ *1.25*-lb. base box	Electro▲▲ *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6, S15*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ▲ COKES: 1.50-lb. add 25¢. ▲▲ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*					7.575 *U1*	9.325 *U1*			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*					
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *U1, W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3* 10.125 *U1, J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

Hollowware Enameling
29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Aug. 21, 1961)

STEEL PRICES

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		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3, S15*		7.70 *B5*	6.725 *B3,R3, S15*	9.025 *B3,B5, S15*	8.30 *B3*	5.30 *B3*				8.00 *W6, S15*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.10 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Aug. 21, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.
S15 Seaway Steel Div., Roblin-Seaway Ind., Inc., North Tonawanda, N. Y.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.16	10.16	11.35	9.70	9.95	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.59	9.45	8.41	8.47	8.26	13.14	18.84	16.65	22 94	22.19
Boston**	.10	10.00	10.50	11.62	12.50	9.95	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.28	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.33	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.48	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	10.65	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	7.91	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.10	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.67	12.85	18 59	16 68	22 69	21 04
Milwaukee**	.15	9.51	10.49	10.42	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.59
New York**	.10	10.17	10.88	11.45	12.47	10.32	11.00	10.54	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.60	10.10	10.76	11.35	9.70	9.95	9.75	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.68	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.95	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.70	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.73	10.66	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	9.72	10.39	11.54	11.89	9.56	10.07	9.72	11.64	.....	16.69	.....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1¼" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2¾" round. cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier: [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Aug. 21, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	71.00†
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)

	Pct
Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)

	Pct
Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

	Pct
Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

(Minimum plating charge — $10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

f.o.b. mill

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Aug. 21, 1961)

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	26.75	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	31.50	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	31.75 48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	29.75	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown. *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6;* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1:* Claymont, Del: *P2.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails ¢/lb.	Woven Wire Fence ¢/lb.	"T" Fence Posts ¢/lb.	Single Loop Bale Ties ¢/lb.	Galv. Barbed and Twisted Barbless Wire ¢/lb.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Chicago *W7*	173	.....	.....	.....	.....	9.00	9.55†
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.80
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2**	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	.....	.....	213	9.95	10.50
Rankin Pa. *A5*	173	187	.....	.....	193	9.00	9.55
So. Chicago *R3*	173	187	.....	.....	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50
SparrowsPt. *B3***	175	.....	.....	215	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

	Net-Ton
Furnace, beehive (f.o.b.)	
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

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Lower initial cost
Long life
Ultra high quality

Small Diameter
ROLLS

Special alloys with tough, fine-grained finish. Surfaces as fine as 3 micro inches RMS. Chrome plating available.

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Rolls reconditioned like new at costs averaging 25% of new rolls. Rolls can be reconditioned several times!

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THE PNEUMATIC GUN . . .
applies adhesive strength of sand-cement layer up to 10" thick in a continuous application!

Force sprays into every crack, crevice and corner for permanent strength in building, repairing or waterproofing concrete construction. Effective for sandblasting, when used without sand-cement mix. Completely dependable, both in operation and results. Has wide application in Steel Industries, Foundries, Refineries, Refractories, all Construction areas.

for details, write to
ALLENTOWN PNEUMATIC GUN COMPANY
1522 WALNUT STREET, ALLENTOWN, PA.
AREA CODE 215, HEmlock 3-4168

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25			
Cleveland *R3*						15.35
So. Chicago *R3*				10.10		
Ensley *T2*	5.75	6.725				
Fairfield *T2*		6.725		10.10	6.875	
Gary *U1*	5.75				6.875	
Huntington, *C16*		6.725				
Ind. Harbor *I3*				10.10		
Johnstown *B3*		6.725				
Joliet *U1*			7.25			
Kansas City *S2*				10.10		15.35
Lackawanna *B3*	5.75	6.725	7.25		6.875	
Lebanon *B3*			7.25			15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *S14*						15.35
Pittsburgh *J3*				10.10		
Seattle *B2*					7 025	15.85
Steelton *B3*	5.75		7.25		6.875	
Struthers *Y1*				10.10		
Torrance *C7*					6.75	
Williamsport *S5*		6.725				
Youngstown *R3*				10.10		

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	9.10				
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*		10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70		
Detroit *D1*	9.05	10.50	12.70	15.70	
Detroit *D2*	9.05	10.50	12.70		
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	15.60	
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*			12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	
New Castle, Pa. *M10*	8.95	10.40	12.60	15.60	
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*		10.70	12.90	16.10	19.30
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper

Rolled elliptical, 18 in. or longer, 5000 lb lots 43.50

Electrodeposited, 5000 lb lots 36.50

OFHC anodes ..... 41.50 to 44.50 (depending on shape)

Brass, 80-20, ball anodes, 2000 lb or more 50.50

Zinc, ball anodes, 2000 lb lots ..... 18.75 (for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb ..... 1.03 (Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb 1.60

Tin, ball anodes $1.26 per lb (approx.).

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum, N. Y.. 65.90

Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit 17.45

Nickel sulfate, 5000 lbs 31.00

Nickel chloride, freight allowed, 100 lb 47.50

Sodium cyanide, domestic, del'd east of Rockies, 200 lb drums.... 25.80

Zinc cyanide, 100 lb, N. Y. 60.75

Potassium cyanide, 100 lb drum N. Y., del'd east of Rockies..... 46.50

Chromic acid, flake type, 10,000 lb or more, N. Y. 30.44

METAL POWDERS

(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)

Iron Powders

Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. 11.50

Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots 25.75

Carbonyl Iron (200 lb lots) 88.00

Welding Grades 8.10

Cutting and Scarfing Grades 9.85

Hydrogen reduced, domestic 11.25

Copper Powders

Molding Grades

Electrolytic, domestic, f.o.b. shipping point. 15.00†

Atomized ..... 44.3 to 62.3

Reduced ..... 15.00†

Chemically Precipitated 45.5

Brass, 5000-lb lots ..... 33.1 to 50.3

Bronze, 5000-lb lots ..... 51.5 to 56.8

Chromium, electrolytic 5.00

Lead ..... 7.50†

Manganese, electrolytic ... $1.00

Molybdenum ..... $3.60 to $4.35

Nickel $1.15

Carbonyl Nickel, 20,000 lb lots $1.01

Nickel-Silver, 5000 lb lots.. 56.0 to 68.0

Silicon 70.00

Solder ..... 7.00†

Stainless Steel, 316 ..... $1.07

Stainless steel 304 ..... 89.00

Tin ..... 15.00†

Titanium, 99.25 + pct, per lb, f.o.b. $11.25

Tungsten, carbide grades... $3.25

Zinc ..... 19.5 to 32.7

† Plus cost of metal.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*) Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (*L4, P2, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
302	.....	.....	.....	37.50
304	28.80	31.55	34.30	39.75
316	42.20	46.25	50.25	58.25
321	34.50	37.75	41.05	47.25
347	40.80	44.65	48.55	57.00
405	24.60	26.90	29.25	.....
410	22.70	24.85	27.00	.....
430	23.45	25.65	27.90	.....

Stainless Type

CR Strip (S9) Copper, 10 pct, 2 sides, $43.85; 1 side, $36.60.

(Effective Aug. 21, 1961)

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.... $185.00

High duty (except Salina, Pa., add $5.00) 133.00

Medium duty 125.00

Low duty (except Salina, Pa., add $2.00) 103.00

Ground fire clay, net ton, bulk... 22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. $158.00

Childs, Hays 163.00

Chicago District 168.00

Western Utah 183.00

California 185.00

Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O. 163.00-168.00

Silica cement, net ton, bulk, Chicago 26.75

Silica cement, net ton, bulk, Ensley, Ala. 27.75

Silica cement, net ton, bulk, Mt. Union, Pa. 25.75

Silica cement, net ton, bulk, Utah and Calif. 39.00

Chrome Brick

Standard chemically bonded, Baltimore, Md. $620.00

Gary, Ind. 658.50

Standard, Pascagoula, Miss. 647.50

Standard chemically bonded, Curtiner, Calif. 119.00

Burned, Baltimore 585.00

Magnesite Brick

Standard, Baltimore $715.00

Chemically bonded, Baltimore 655.00

Chemically bonded, Pascagoula, Miss. 682.50

Grain Magnesite

St. ⅝ to ½-in. grains *Per net ton*

Domestic, f.o.b. Baltimore in bulk. $73.00

Domestic, f.o.b., Pascagoula, Miss... 80.00

Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk ..... 46.00 in sacks 52.00-54.00

Dead Burned Dolomite

F.o.b. bulk, producing points in: Pa., W. Va., Ohio $16.75

Missouri Valley 15.60

Midwest 17.00

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

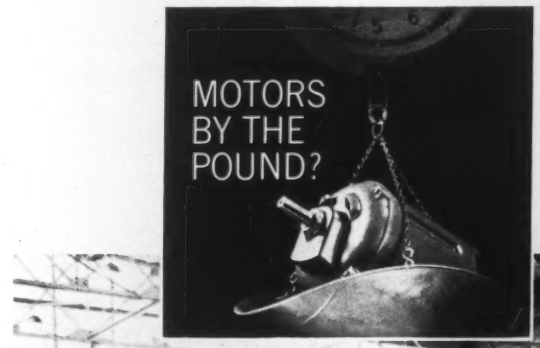
GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100, 110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.74
Jones & Laughlin *	2½	12	54.23	63.57	48.13
Ohio Seamless Tube	3	12	62.62	73.40	55.59
Div., Copperweld	3½	11	73.11	85.70	65.84
Steel Co.*	4	10	97.08	113.80	88.10
National Tube.....	2	13	40.28	47.21	35.74
	2½	12	54.23	63.57	48.13
	3	12	62.62	73.40	55.59
	3½	11	73.11	85.70	65.84
	4	10	97.08	113.80	88.10
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

* Electricweld only.



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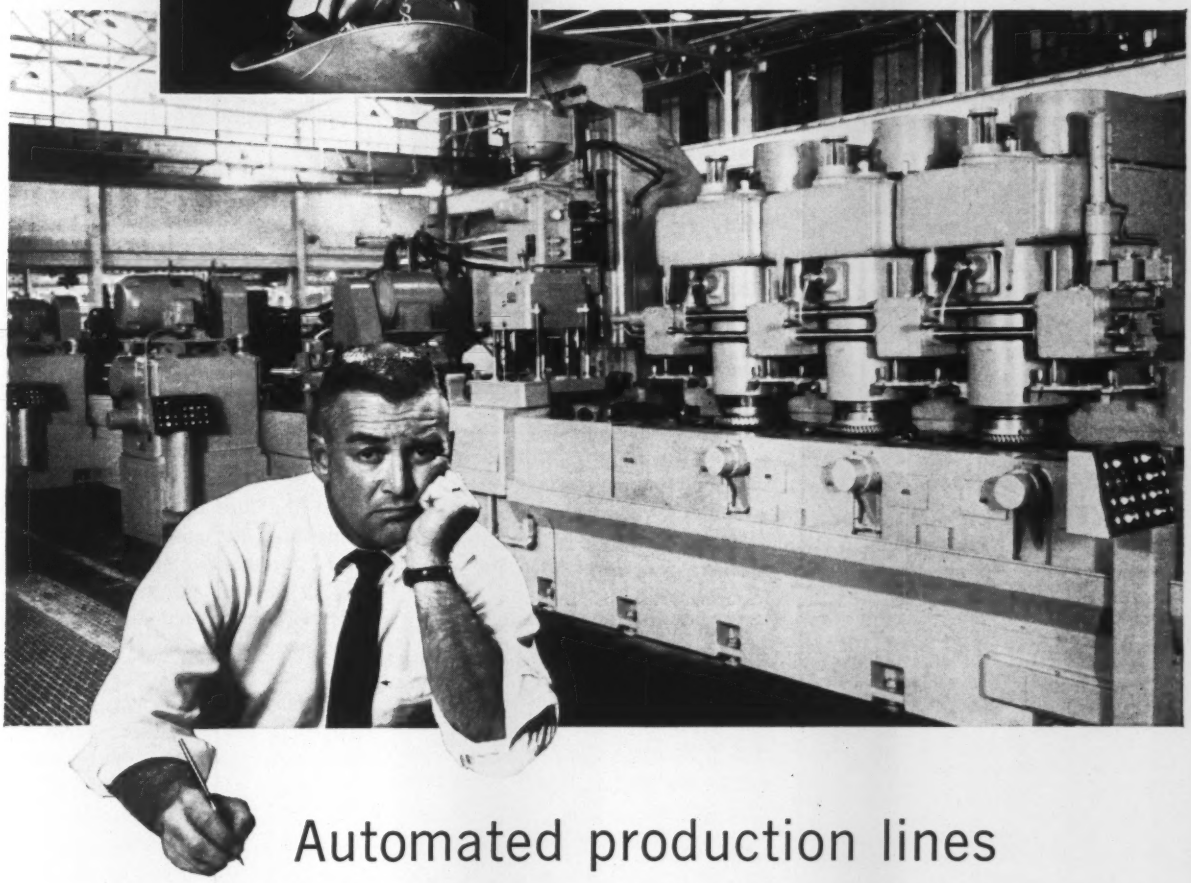

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No better values at any price

100 CFM 150 psi 6 x 7 Ing.
188 CFM 100 psi 7 x 7 Ing.—CPT—Worth
183 CFM 150 psi 7 x 7 Joy WG9.
234 CFM 100 psi 9 x 9 Ing.—Worth Chic. Penn.
290 CFM 75 psi 10 x 9 Ing. ES-1
368 CFM 100 psi 12x10 Ing. Rand ERI
405 CFM 100 psi 12 x 11 IR—Worth—CP
528 CFM 100 psi 14 x 12 Penn. SA
502 CFM 125 psi 12 x 13 Ing. Rand. Worth.
676 CFM 110 psi 15-9¼x 12 IR-XRE
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Plenty of Inquiries In Pittsburgh Area

It's still a spotty used machinery market, with a few short-lived order spurts.

But dealers expect a genuine recovery in the fall. Most are getting plenty of inquiries now despite the ups and downs.

■ Pittsburgh dealers still report a spotty market.

There is a feeling of expectancy. And there have been a few order spurts. But there is still no broad, sustained improvement.

Summer vacations are blamed by some for the lag. Uncertainty of business generally shows up in the reports of others. In any case, it is clear demand has yet to show any real continuity.

Pattern Shift—The experience of one electrical supplier points up the day-to-day shifting of buying patterns. He had a sharp pickup of orders in May. This was the month steel operations hit a peak.

Demand fell off again in June and early July, when steel production tapered off. In late July, orders for electrical equipment moved up again. The movement came as steel mills were getting indications of an improvement in their own business.

August Dip—When August fell short of mill expectations, orders for electrical items again dipped.

This lull has continued but the same dealer looks for a decisive improvement in the fourth quarter. Inquiries have been developing into orders at the rate of about two to ten.

If this ratio holds, the current level of inquiries means a heavy volume of fourth quarter orders.

General Items — A somewhat similar picture is painted by a supplier of general machinery. There was a little spurt of business in July but demand has sagged again. Orders vary widely from week to week and company to company.

This dealer feels vacations are a factor in the lag. In three separate cases, orders are being held up because key people are away. Once the holiday season is out of the way, and the recovery takes general effect, a sustained improvement is expected.

At the moment, vertical boring mills are attracting the most interest for this dealer. A good supply of general purpose equipment is reported. Special machinery can present problems.

Price Factor — Prices are down from the levels of three years ago for general machinery. But they are not considered really depressed. Pricing is still not a decisive factor in closing sales of large machines.

Another supplier of general machinery says things are still "pretty quiet." What interest there is centers on machine tools. Customers are still doing a lot of shopping, and then buying quickly.

Buyers Market—The overall supply is called good by this dealer, but late models are tight. On pricing, it is "still a buyers market."

A materials handling dealer shares the general view that prosperity has yet to arrive to stay. Business has "sort of sagged" after a period in which there were a "few little orders."

In all the ups and downs, dealers see a genuine recovery starting to take shape.

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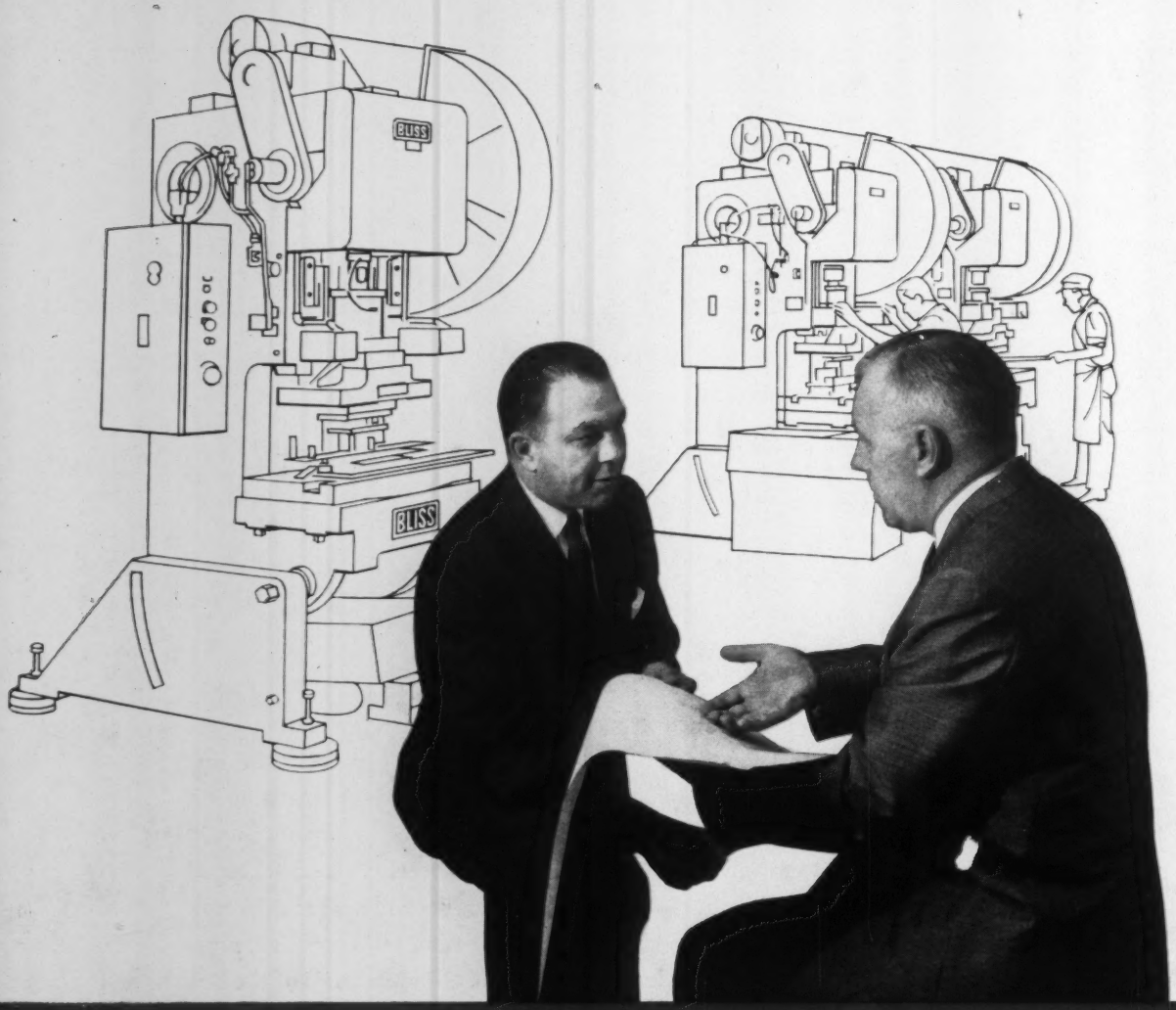

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